

ERIC Document Resume		See Instruction Sheet		DATE OF RESUME 6/22/65	DATE RECEIVED
A. PUBLICATION DATA					
1. ERIC NUMBER ED000113		2. ORIGINATOR CONTROL NO(S) 7451		3. IDENTIFICATION NO. N.A.	
4. AUTHOR(S): Grobman, Hulda				DO NOT WRITE IN SPACE BELOW	
5. TITLE OF DOCUMENT ABSTRACTED: Meeting the West's Health Manpower Needs				MICROFILM COPY AVAILABLE YES ☒ NO ☐	
				COPYRIGHT GRANTED YES ☐ NO ☒	
				COPYRIGHT RELEASE FILED YES ☐ NO ☐	
6. PUBLICATION TITLE: N.A.				TYPE OF REPORT	
7. EDITOR(S): N.A.		8. PLACE OF ORIGIN ORG. WICHE ST. Fleming Law Bldg. CITY, STATE Univ. of Colo. Boulder, Colo.		PROPOSAL ☐	
9. PUBLISHER OR SOURCE Western Interstate Commission for Higher Education				IN-PROGRESS ☐	
10. VOL. N.A.		11. PAGES N.A.		12. MO./YR. 50	
13. TOTAL PP. 75		TELE. EXT. INST/LOC CODE		OTHER ERIC REFERENCES:	
ERIC SATELLITE CODE					
B. INDEXING DATA					
14. SUBJECT AREA			15. TYPE OF ENDEAVOR report		
16. INDEXING TERMS (8-12)					
needs		bldgs. & equip.		dental edu.	
resources		medical edu.		interinstitutional coop.	
professional edu.		nursing edu.			
17. ABSTRACT (MAX. 250 WORDS)					
A summary report relating manpower needs to present higher education facilities in health sciences, such as medicine, dentistry, nursing, veterinary medicine, mental health, and public health. Also considers the sharing of facilities across State lines.					
ERIC No.					
18. SOURCE OF ABSTRACT					
C. FUNDING DATA					
19. SUPPORTING ORGANIZATION			20. DIVISION OR DEPT.		21. CONTRACT NO.
			22. TOTAL COST OF PROJECT		PROJECT NO.
			23. DURATION OF PROJECT		
					U.S. Department of Health, Education, and Welfare Office of Education

Meeting the West's Health Manpower Needs

U. S. DEPARTMENT OF HEALTH, EDUCATION AND WELFARE
Office of Education

This document has been reproduced exactly as received from the person or organization originating it. Points of view or opinions stated do not necessarily represent official Office of Education position or policy.

The *Western Interstate Commission for Higher Education* is organized under the Western Regional Education Compact, to promote interstate cooperation in higher education. A major responsibility of the Commission is the study of immediate and long-range needs and resources for professional education in the health sciences.

Members:

Alaska	Nevada
Arizona	New Mexico
California	Oregon
Colorado	Utah
Hawaii	Washington
Idaho	Wyoming
Montana	

**WICHE PUBLICATIONS ON HEALTH SCIENCE
MANPOWER**

Mental Health Training and Research in the Western Region, 1956

Dental Manpower Requirements in the West, 1956

A Review of the WICHE Student Exchange Program, 1958

Veterinary Medicine in the West, 1958

The West's Medical Manpower Needs, 1959

Nurses for the West, 1959

5-18
R

HE7451

7451

ED000113

MEETING THE WEST'S

HEALTH MANPOWER NEEDS

Western Interstate Commission for Higher
Education

Fleming Law Building
Boulder, Colorado

- 1960 -

ED0000113

This report was written by Dr. Hulda Grobman. Statistical materials were prepared by Hall T. Sprague and Marjorie Black. Final copy was prepared by Eleanor Muhn. The report was prepared under the general direction of Dr. Richard G. Axt, Associate Director.

ED 0000113

1949 - The Western Governor's First Step

It is the consensus of the Western Governors' Conference:

1. That the future of the country and of the Western states is dependent upon the quality of the education of its youth;
2. That all of the states individually and alone do not have sufficient numbers of potential students to warrant the establishment and maintenance of adequate facilities in all of the essential fields of technical, professional, and graduate training; nor do all of the states have the financial ability to furnish within their borders institutions capable of providing acceptable standards of training in all of the fields mentioned above;
3. That the Western states, or groups of such states within the region, cooperatively can provide acceptable and efficient educational facilities to meet the needs of the region and of the students thereof.

The Western Governors' Conference believes that a cooperative plan among the Western states is necessary and desirable and should be developed to provide more extensive facilities and training for the students of this region.

Resolution adopted by the
Western Governors' Conference
November 8, 1949

TABLE OF CONTENTS

	Page
I. Western Health Manpower Highlights	1
II. Physicians for the West.	11
III. Dentists for the West.	16
IV. Nurses for the West.	22
V. Veterinarians for the West	28
VI. Mental Health Personnel for the West	31
VII. Public Health Personnel for the West	42
VIII. Sharing Facilities Across State Lines.	50
Appendix I - Methodology.	56
Appendix II - State by State Data	57
Appendix III - Western Professional Schools in the Health Sciences. . . .	70
Appendix IV - WICHE Committees.	73

FOREWORD

This staff report was prepared for the leaders in each state who are responsible for planning for the development of higher education in the coming decade. It is a summary report to give Governors, legislators, budget officers, and educational leaders a perspective of the health science manpower problems their states will face in the 1960's, and the relationship of manpower needs to present education facilities in the health sciences.

In the West, the manpower situation in the various health sciences is approaching critical dimensions. This situation has not developed overnight; it has been building up for years. Before World War II, because of heavy in-migration of professional persons, the Western health science manpower situation was relatively good, despite the fact that the West has relatively few professional schools. However, since the tremendous post-World War II influx of people and the increased birth rate, the ratio of professional people--of doctors, dentists, and nurses--to population has been dropping, and there is no indication of a future reversal of this trend. Western schools are not graduating enough doctors, dentists, and nurses to maintain the present levels of health service. To date, the West has depended on the bounty of other regions to provide its health manpower; but this is no longer an adequate source of supply.

The existing and potential manpower shortages in the health sciences were one of the urgent reasons for the establishment of the Western Interstate Commission for Higher Education (WICHE) in 1953. The Commission was instructed to give top priority to providing adequate services and facilities in the fields of dentistry, medicine, public health, and veterinary medicine. The Compact setting up WICHE states that:

It shall be the duty of the Commission to undertake studies of the needs for professional and graduate education facilities in the region, the resources for meeting such needs, and the long-range effects of the Compact on higher education; and from time to time to prepare comprehensive reports on such research for presentation to the Western Governors' Conference and to the legislatures of the compacting states and territories.

Meeting the West's Health Manpower Needs was prepared in pursuance of this responsibility.

This report represents the first Western effort to evaluate the broad field of health science manpower on a regional basis. Earlier WICHE studies have been limited to such individual areas as medicine or dentistry. Although such an examination of the needs of the individual disciplines in detail is necessary, it is equally urgent that this broader view be taken, since in large part the health sciences are interdependent. The most obvious examples of the interdependence are mental health and public health. Both of these are "derivative" fields, in that they draw for personnel and skills on such other professions as medicine, nursing, psychology, and engineering. Thus, manpower for mental health and public health depends not only on the specialized training facilities for these two fields but also on those of the feeder professions. Unless enough doctors and nurses are graduated from medical and nursing schools, there will not be enough to go on to mental health and public health programs.

Furthermore, the individual states of the West cannot and should not be self-sufficient in all of the specialized fields of higher education. The higher education systems of the Western states should not be built in "isolated proximity." Viewing all health needs on a regional basis should give a better perspective to the opportunities for regional or sub-regional cooperation, and for the development of complementary specialization in the various areas of health manpower.

At the same time that we consider education in the health sciences, we must remember that the quality of the professional schools is dependent on the soundness of undergraduate collegiate education programs. It would be folly for states to plan expensive graduate health science facilities at the same time they give inadequate support to undergraduate programs, and to graduate programs in other fields. While the need for education facilities in the health sciences is a highly dramatic one, building and maintaining sound undergraduate collegiate education programs is of at least equal importance. In fact, the quality of professional education can be seriously limited by the quality of general undergraduate collegiate education. Without a sufficient number of good colleges and universities, the supply of good freshman medical students, dental students, psychologists, and social workers will be limited.

By considering the West's educational needs on the broad basis of the health sciences, it is hoped that this report will provide a useful perspective to educators, policy makers, and opinion leaders in making realistic plans for balanced growth of health science education for the coming decade.

Harold L. Enarson
Director

February 29, 1960

WESTERN HEALTH MANPOWER HIGHLIGHTS

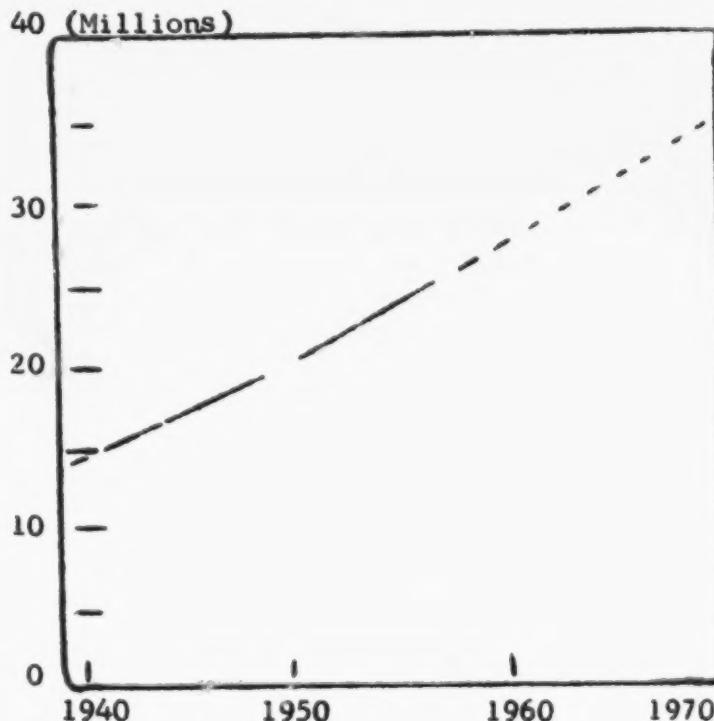
THE POPULATION GROWTH

Commonplace as discussions of past and anticipated population increases may be, few people have recognized the real magnitude of these increases and the impact they will have. And there has been little realistic planning in the health sciences that reflects reasonable expectations for population increases.

The population of the West rose from 14 million in 1940 to 26 million by 1958. By 1970, it is expected to reach 35 million. Between 1958 and 1970, the West will add 9 million more people, an increase equivalent to adding five states the size of Oregon.

The entire country is growing rapidly, but the rate of growth of the West is faster. Between 1940 and 1958, the West's population increased 81 per cent, while the nation's population increased 32 per cent. From 1958 to 1970, the West is expected to increase 35 per cent while the national increase will

The rapid growth of the West over the past decade is expected to continue



only be 18 per cent. In 1940, the West accounted for 11 per cent of the nation's population; by 1958, it had 15 per cent; and in 1970 it is expected to have 17 per cent.

DEMAND FOR HEALTH SERVICES

Although there is a margin of error in any predictions of the future demand for any services--including health services--informed estimates can be made on the basis of past trends and common sense observations, and the margin of error can be reduced to the point that realistic planning is possible. And plan we must, if we are to maintain and improve the health services available to Westerners.

Naturally, the demand for health services is increased by the increase in population. If all other factors remain constant, there would be a proportionate rise in the demand for health services. However, some variation in the other factors can be expected.

Factors tending to reduce the future demand for health services.

As the health sciences have progressed from the horse-and-buggy days, with faster means of transportation, the development of clinics, and a larger proportion of medical service being given in hospitals, the time of doctors and nurses is conserved, and medical personnel can work with an increasing number of patients. This trend may continue in the future.

Through use of medical and dental technicians and other trained supporting personnel, the doctor's and dentist's time has already been conserved. Further use of such personnel may save still more of the doctor's and dentist's time.

Modern treatment techniques and drugs have virtually eliminated such diseases as malaria and typhoid, and have reduced the seriousness of such other diseases as streptococcus infection and pneumonia. Fluoridation of water supplies is expected to reduce dental caries. Future developments in the health sciences can be expected to further reduce the incidence and virulence of many other diseases.

Such factors as these may mean that, in the future, health science personnel can use their time more efficiently and effectively, thereby reducing the relative need for more personnel.

Factors tending to increase the future demand for health services.

Despite the revolution in medical practice in recent decades, the ratio of physicians to population in the United States has remained relatively constant, and the ratio of nurses to population has increased. Yet no one seriously suggests that there is a surplus of personnel in these

health sciences, or that all the public's needs are being met adequately. The drop that has occurred in the dental ratio in recent years is viewed with alarm because of the increasing demand for dental service and the large proportion of untreated dental disease. Thus, in each of these areas of health science, previous trends do not give substance to the hope that in the coming decade the needed ratio of health personnel to population will be reduced by scientific developments or by changed manpower practices.

Experience indicates that the demand for all health services rises as individual income and education levels rise and as the population becomes more highly urbanized. It rises with the increase in health insurance coverage. Since income, educational level, urbanization, and health insurance coverage are all expected to rise further in the next decade, a further rise in the demand for all health services can be expected. Furthermore, the disproportionately high population increase expected in the under-18 age group means increasing health service demands, since this group requires extra health services--for example, for inoculations, childhood illnesses, and orthodontia.

Furthermore, there is no doubt that many of the health services are now undermanned. Many persons in the health sciences are working overly long hours, or are spending less time than they would like with an individual patient, because there is no one else to serve the patient. There are communities that cannot replace a doctor or dentist who retires or dies; the records of the armed forces indicate an alarming backlog of untreated dental disease in inductees; from time to time, hospital wards throughout the country are closed down because of insufficiently trained nursing personnel. In public health and mental health, there are budgeted positions unfilled, and positions filled by persons who lack the requisite special training for their posts; there are facilities that have not been built and services that have not been inaugurated because of the impossibility of adequately staffing them. In mental hospitals, there is insufficient personnel to give treatment that we know could increase the patient discharge rate.

In each of the health science fields, the present ratio of professional personnel to population, or a still higher ratio has been set by experts as minimum goals.

CURRENT HEALTH MANPOWER IN THE WEST

As of 1958, the West had:

- ...34,000 physicians
- ...13,000 active dentists
- ... 600 active dental hygienists
- ...68,000 active nurses
- ... 3,000 active veterinarians

The West as a whole is slightly above the national average in the ratio of doctors, dentists, nurses, and veterinarians per 100,000 population. However, a few Western states with high ratios obscure the fact that most Western states rank far below the national average. Furthermore, except for veterinarians, the present ratios are less favorable than those of 1940, and they are also below the standards that are considered desirable for the respective professions.

A major reason for the declining ratios of professional personnel to population is the fact that the West has depended heavily on immigration of professional persons and on educating its students in schools that are out of the region. Obviously these sources no longer provide enough trained personnel.

In mental health and public health, the shortages of personnel are indicated by the large number of budgeted positions that are not filled, by the inadequacy of the training of many present staff members, and by failure of public institutions and agencies to meet recognized staffing standards.

EXISTING WESTERN FACILITIES FOR EDUCATION IN THE HEALTH SCIENCES

At present, the West has 9 medical schools,¹ 6 dental schools, 4 schools for dental hygienists, 3 schools of veterinary medicine, and 1 accredited school of public health.² It has 37 collegiate schools of nursing, 17 junior college nursing programs, and 57 diploma schools of nursing.³

Of the 13 Western states:

... 8 have no school of medicine. (Of the 11 states in the nation without a medical school, 8 are in the West.)

... 10 have no school of dentistry. (There is no dental school in the 8 states of the Rocky Mountain West.)

... 10 have no school for dental hygienists.

... 1 has no school of nursing.

¹ Does not include schools of osteopathy. There is one college of osteopathy in the region.

² It is expected that a second school will be accredited in the near future.

³ As of January, 1959.

...10 have no school of veterinary medicine

...12 have no school of public health. (There is only one accredited school of public health west of the Mississippi River.)

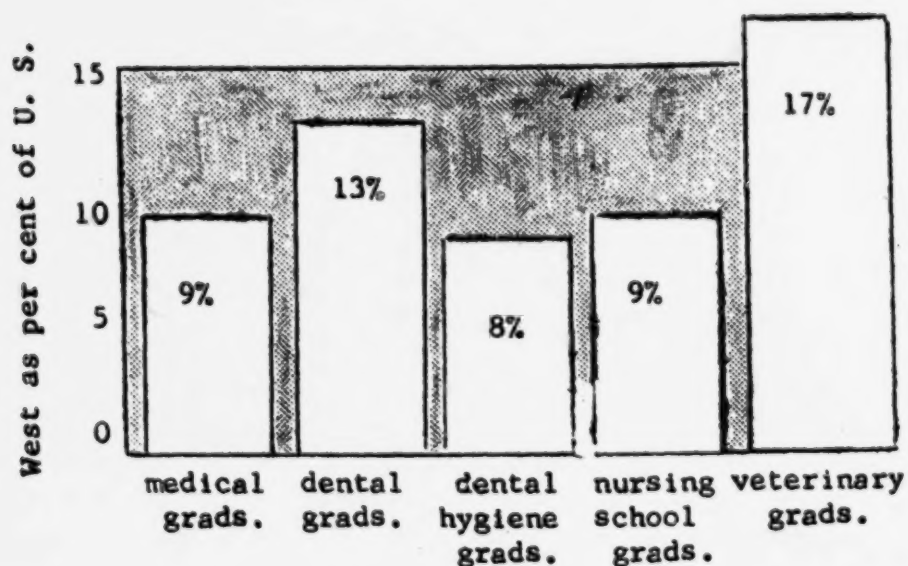
... 7 have no graduate or professional training facilities in the health fields; 7 have no training program in psychiatry, 8 have none in clinical psychology, 9 have no specialization in psychiatric nursing, and 8 have none in psychiatric social work.

Western schools are graduating 600 new doctors, 400 dentists, 80 dental hygienists, 2,650 nurses, and 150 veterinarians each year.

However, although the West now has 15 per cent of the population of the United States, it is graduating only:

... 9 per cent of the nation's physicians
...13 per cent of its dentists.
... 8 per cent of its dental hygienists.
... 9 per cent of its nurses.
...17 per cent of its veterinarians.

Today, the West--with 15% of the population in the U.S.--is producing less than its share of doctors, dentists, nurses and dental hygienists.



HEALTH SCIENCE MANPOWER NEEDED IN THE WEST BY 1970

By 1970, the West will need:

...27,200 additional physicians, or 2,300 per year.
...20,500 additional dentists, or 1,700 per year.
... 2,850 additional dental hygienists, or 250 per year.
...78,000 additional nurses, or 6,400 per year.
... 2,500 additional veterinarians, or 200 per year.

The annual increment we need in each of the professions is based on a 12-year average. As each year goes by without providing this average increment, a further deficit will be accumulated, thereby raising the numbers of new personnel needed in the remaining years.

For every 10 DOCTORS in the West now - we must add 8 new ones by 1970.

For every 10 DENTISTS in the West now - we must add 16 new ones by 1970.

For every 10 DENTAL HYGIENISTS in the West now - we must add 50 new ones by 1970.

For every 10 NURSES in the West now - we must add 11 new ones by 1970.

For every 10 VETERINARIANS in the West now - we must add 8 new ones by 1970.

THE DEFICIT

If we continue our present graduations from Western schools, we will produce only:

One-fourth of the doctors needed



of the 2300 needed annually

One-fourth of the dentists needed



of the 1700 needed annually

One-third of the dental hygienists needed



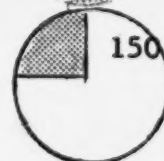
of the 250 needed annually

One-third of the nurses needed



of the 6400 needed annually

Almost enough veterinarians



of the 200 needed annually

In mental health, with present educational facilities, to bring today's Western state mental institutions up to the current staffing pattern of Veterans' Administration hospitals, it would take:

- ...29 years to fill the gap in psychiatry.
- ...21 years to fill the gap in clinical psychology.
- ... 9 years to fill the gap in social work.

And this still omits personnel to man the additional mental hospital beds we need, the mental health clinic needs, needs for additional personnel resulting from population growth, and the still higher minimum standards of adequacy set by the American Psychiatric Association.

In public health, for the United States as a whole, the backlog of current training needs is so great that it would take 16 years to fill the gap with present programs, even if there were no drop-outs from the labor market, no increase in population, and no new needs for public health service.

ADDITIONAL EDUCATION FACILITIES NEEDED

- | | |
|-----------------------------|---|
| For medicine ... | Over 1,000 additional graduates annually; an immediate goal of <u>at least</u> 500 additional graduates per year <u>has been</u> set by the Commission's Medical Education Advisory Committee. |
| For dentistry ... | 1,260 additional graduates annually. |
| For dental hygiene ... | 150 additional graduates annually. |
| For nursing ... | A minimum of 2,000 more graduations annually at the diploma school or junior college level, 1,000 at the baccalaureate level, and 650 at the master's level, plus a significant number of post-master's students. |
| For veterinary medicine ... | Strengthening and expansion of graduate programs. |
| For mental health ... | Present facilities for training mental health personnel are clearly inadequate. Additional facilities are needed. |
| For public health ... | Present facilities for training public health personnel are clearly inadequate. Additional facilities are needed. |

THE STATE'S OBLIGATION

Each state has a two-fold obligation in relation to health science manpower--the obligation to make educational opportunity available to its citizens, and the obligation to provide for meeting the health needs of its citizens. Whether or not a state has a medical, dental, nursing, and veterinary medicine school, it still has the obligation to provide educational opportunity for its citizens. However this obligation is not always met; for example, in those states without medical schools, fewer of the college age group are medical freshmen than is the case in states with medical schools. Further, not all states without professional schools are providing their citizens with the health manpower they need; such states generally have lower ratios of professional personnel per 100,000 population, so that the health needs of their citizens are less well met.

THE STUDENT EXCHANGE PROGRAM

Since 1953, states of the West have participated in the WICHE Student Exchange Program in medicine, dentistry, and veterinary medicine. Under this program, states without schools have bought places for their students in a school within the region. In this way, they have provided for the education of hundreds of new doctors, dentists, and veterinarians.

This program has been extremely useful, and undoubtedly will continue to be effective in the future. However, it alone cannot solve the region's anticipated health manpower shortages since there will not be enough educational facilities in the region to share. Thus, the West must seek new ways of providing professional education in the health sciences if it is to offer educational opportunities to Westerners and if it is to have the health manpower needed to man the region's essential health services.

THE PROBLEM

- ... Present training facilities in medicine, dentistry, nursing, mental health, and public health are clearly inadequate. More training facilities must be added.
- ... New ways must be found to share educational facilities in the West, since each state cannot be self-sufficient in all of the health science disciplines.
- ... Because of the rapidly changing nature of each of the health sciences, additional provision for continuation education is urgent, so that the trained practitioners can be kept informed of developments in their fields.
- ... Attention is needed on selective recruitment and financial assistance to students so that enough qualified people will enter the health science professions.

- ... To conserve scarce manpower, additional trained supporting health science personnel--technicians, aides, laboratory assistants--are needed; additional training programs for these personnel are needed.

RECOMMENDATIONS

- ... Each state should assess its manpower situation in all of the areas of health science, in terms of present supply, needs over the coming years, and educational facilities to train the needed personnel. It should draw up a comprehensive plan and a timetable for meeting the needs of the future years, and these should be reviewed and revised periodically as conditions change. This master plan should be the clear responsibility of some individual or group in the state.
- ... Wherever possible, it is imperative that the capacity of existing schools be expanded.
- ... Expansion of existing schools cannot possibly provide the health science manpower needed in medicine, dentistry, and nursing. New schools in each of these fields should be established.
- ... New programs are needed for training supporting health science personnel. Without an adequate supply of such trained personnel as laboratory technicians, dental technicians, medical technicians, and dental hygienists, the doctors, dentists, and nurses we now have cannot work at optimal efficiency.
- ... Systematic efforts are needed for extending continuation education programs in all the health sciences.
- ... In the WICHE Student Exchange Program in medicine, dentistry, and veterinary medicine, the sending states should take steps to cover all of their students who attend Western professional schools in these fields.
- ... Consideration should be given to developing other forms of student exchange across state lines in those health manpower professions not included in the present student exchange program.
- ... It is timely to consider new ways of sharing educational facilities, for example, building a shared resource--with either joint construction of a multi-state facility or with an out-of-state contribution toward capital outlay costs. This is particularly pertinent to the less populous states--to the eight Western states with less than 1,000,000 population--where the cost of financing a new medical school, for example, could well be prohibitive.

A multi-state facility would be a completely new kind of venture, a clear departure from past practice in publicly supported higher education. However, the Western Governors' Conference has recognized that

old methods are inadequate to meet the coming crisis in health sciences education and has asked WICHE to explore the feasibility of creating regional facilities in the health sciences, particularly in medical education.

II.

PHYSICIANS FOR THE WEST

Fifty years ago, prior to the Flexner Report on American medical education, the country was faced with a surplus of new physicians--many with substandard training--being graduated from its medical schools. Since then, medical education has been systematically upgraded, and today's Doctor of Medicine degree represents high quality education. But now we are producing too few physicians.

At present, medical education consists of three or four years of undergraduate collegiate education, four years of medical school, and from one to six years of internship and residency training; the average physician spends three-and-one-half years in postgraduate training.

The last 25 years have seen a revolution in the practice of medicine, both through the discovery of new drugs and the technological developments in science and engineering. There has also been a change in terms of the patterns of practice. Where fifty years ago, most physicians were in general practice, today a large number are in research, public health, industrial medicine, teaching, military medicine, and hospital practice. Only 69 per cent of all physicians are engaged in private practice, and of these, almost half are specialists.

PRESENT SUPPLY OF PHYSICIANS

The West's 34,000 physicians give the region an average ratio of 137 physicians per 100,000 population compared to the national ratio of 133 physicians per 100,000 population. In terms of a statistical average, the West has relatively more physicians than the country as a whole;

This chapter is based in part on The West's Medical Manpower Needs, Western Interstate Commission for Higher Education, 1959, and Physicians for a Growing America, Report of the Surgeon General's Consultant Group on Medical Education, U.S. Department of Health, Education, and Welfare, 1959.

however, almost half its population is not well situated when it needs a doctor. The Western ratio is above the national average only because of California and Colorado. The other Western states are below both the Western and the national averages. Furthermore, there are now relatively fewer physicians in the West than there were in 1940, and in each of the Western states the physician-population ratio declined from 1955 to 1957, and again to 1958.

In the last decade, no Western state has educated as many as one third of its new physicians. In each of the Western states, an overwhelming majority of their new physicians were either physicians previously licensed in other states or new graduates of out-of-state schools. Of the 26,500 physicians licensed in the West in the ten years from 1947-1956, only 6,200 either were educated in the West or had previously been licensed in another Western state; and 85 per cent were educated outside the state where they were licensed. Colorado, which was the most self-sufficient of the Western states, imported 68 per cent of the physicians it licensed during the last decade.

WHAT IS A SATISFACTORY PHYSICIAN-POPULATION RATIO?

There is no agreement in the profession as to what is a satisfactory physician-population ratio for today. It is even more difficult to set a satisfactory ratio as a goal for the West a decade hence. In 1957, the ratio of active non-federal physicians per 100,000 population ranged from a low of 70 for North Dakota to a high of 194 for New York and 179 for Massachusetts,¹ and a regional high for New England of 162 physicians per 100,000 population. The national average was 133, and the Western average was 137. Which of these is "satisfactory"--or will be a decade hence?

There is general agreement that no region in the country has too many doctors today, even when it has twice the physicians per 100,000 population that some Western states now have. Certainly no one would argue that any Western state has surplus of physicians. Many small communities are unable to replace physicians who leave active service. Many posts for public health physicians, psychiatrists, and staff physicians are unfilled. It is common knowledge that not all the medical care needs of the public are being met. Thus, it seems clear that the present Western ratios are not excessive.

There are a number of factors that have modified the demand for medical services in the past, and that may be expected to influence it further in the future:

¹The District of Columbia had a ratio of 291, but this undoubtedly reflects the concentration of medical facilities in the District to serve a multi-state residential area.

New drugs have already virtually eliminated some diseases that had been widely prevalent--such as typhoid or diphtheria, and further discoveries can be expected to eliminate or reduce the impact of other diseases. The doctor is now aided by more supporting personnel--by nurses, technicians, technical assistants, who relieve him of some of the tasks he formerly carried on himself. In 1900, for every physician in practice, there was one other professional health practitioner; today, there are four such persons for every physician; and in the future, probably there will be still more supporting personnel. As more people are treated in hospitals and clinics, as fewer home calls are made, the physician's time is conserved.

On the other hand, it is possible to identify several factors that influence civilian demands for medical services, as for example: the rising income and educational levels, the rising proportion of population living in cities, and the increasing coverage of health insurance. In the future, it is expected that the income and educational levels of Westerners will continue to rise, that a far greater proportion of the West's population will live in cities, and that health insurance will continue to grow. In view of the anticipated trends, it is reasonable to assume that these factors will increase the demands for medical services in the coming decade.

In weighing the factors that affect the demand for medical care in the future, both the WICHE Medical Advisory Committee and the U. S. Surgeon General's Consultant Group on Medical Education concluded that present physician-population ratios appear to be an absolute minimum for the next decade.

THE PHYSICIANS NEEDED BY 1970

As of 1958, the West had a total of 34,000 physicians. For 1970, it is estimated that a total of 50,600 will be needed if the 1955 ratio of physicians to population is to be maintained. To reach this total number of physicians will require the addition of 13,700 physicians to take care of population increases, and another 13,500 physicians to replace those who will leave active practice during the 12-year period. This makes a total of 27,200 new physicians to be added in the 12-year period, or 2,300 new physicians to be added annually, if the 1955 physician-population ratios are to be maintained.

PRESENT EDUCATIONAL FACILITIES

The West now has nine medical schools, five in California and one each in Oregon, Washington, Utah, and Colorado. With the exception of one of the California schools and the Washington school, which were organized in 1951 and 1945 respectively, the Western medical schools are all more than 50 years old. The current graduation rate from Western medical schools --of 600 new doctors annually--represent only an 18 per cent increase over

the 1951 graduation rate, though the West's population increased 28 per cent during this time.

The states without medical schools have relatively fewer freshman medical students per 100,000 population, and more than half of the students from Western states without medical schools go outside the region for medical training. However, the ability of Western students to gain admission to schools outside their home state is declining. Increasingly medical schools throughout the country are closing their doors to non-residents. All state-owned medical schools except Vermont's either entirely restrict admission to state residents or give state residents preference, and 14 private medical schools give preference to residents of their own state.

All of the region's medical schools, both public and private, participate in the WICHE Student Exchange Program. Sending states pay the receiving schools \$2,000 annually for each student in the program. In 1958-59, the Exchange Program covered 94 medical students from five Western states without medical schools; however, this does not include all medical students from Western states without medical schools who are attending Western schools.

THE MEDICAL MANPOWER OUTLOOK

If the present graduation rate from the West's medical schools is continued, the West will produce only one-fourth the physicians needed annually to maintain the 1955 physician-population ratio. As shortages of medical education facilities increase throughout the country, it is likely that it will be increasingly difficult for Western students to gain admission to non-Western schools; thus it is probable that fewer Westerners will leave the region for medical education.

Some net in-migration of physicians from other regions can be expected in the coming years. However, recent experience has indicated that in-migration of physicians cannot be depended on to maintain the Western physician-population ratios.

RECOMMENDATIONS

- ... The West should plan for at least 500 additional medical school graduates per year. To do this, each existing medical school should consider ways of expanding present student capacity. In addition, new medical schools are needed in the region.
- ... Each state should carefully assess its medical manpower needs and set up a blueprint for meeting these needs. It will not be possible for every state to be self-sufficient in medical educational facilities. Therefore, there should be careful consideration of the possibility of establishing a multi-state facility.

... The Student Exchange Program should be extended to take advantage of any additional existing places available in the medical schools of the region. Every state without a medical school should immediately extend the coverage of the Student Exchange Program to include all of its residents who attend Western medical schools. Furthermore, the basis of payment by sending states should be re-examined in the light of changes in costs of education in the five years since the present rate of \$2,000 per student was set.

... Because of the rapidly changing nature of the practice of medicine, attention should be given to postgraduate continuation education, particularly in those states where there is no medical school, since physicians in such states have less access to courses offered by the medical schools.

DENTISTS FOR THE WEST

It was not until the second half of the 19th Century that formal education for dentistry replaced the earlier apprenticeship-type training. With the advent of formal dental education, many proprietary dental schools were set up, and dentists were produced in quantity. In 1918, the profession took steps to establish minimum standards for dental schools, and the American Dental Association's Council on Dental Education made its first classification of all dental schools for accreditation purposes.

As a by-product of the profession's continuing successful efforts to raise standards, many marginal schools were eliminated. During the depression years, lack of money caused additional dental schools to close. Raising of entrance and graduation standards at many of the remaining schools reduced their output of new dentists. As a result, there was a decrease in the number of dental graduates during the 1920's and 1930's. This was reflected in a declining ratio of dentists to population. Although dental education facilities were expanded substantially during and after World War II, increases in the supply of dentists are still lagging behind population growth.

PRESENT SUPPLY OF DENTISTS

In the last 30 years, the relative supply of dentists throughout the country has declined. The national ratio dropped from 58 active dentists

This chapter is based in part on Dental Manpower Requirements in the West, Western Interstate Commission for Higher Education, 1956, and Appendix A, "Dentists for a Growing America," of Physicians for a Growing America, Report of the Surgeon General's Consultant Group on Medical Education, U.S. Department of Health, Education, and Welfare, 1959.

per 100,000 civilian population in 1930 to 46 per 100,000 population currently. Although the number of dental schools in the United States has risen from 39 at the end of World War II to 47 today, and enrollments stand at twice their immediate post-war level, today the dental schools are not producing enough new dentists to keep pace with population growth.

In the West, although the ratio of dentists to population is still slightly above the national average, the decline has been even more rapid than that for the nation as a whole. The West, with 50 active dentists per 100,000 civilian population, has relatively fewer dentists today than it did 30 years ago. Also, trained dental hygienists to assist dentists have not been widely used in the region.

The West Coast states--the only states in the region with dental schools--rank relatively high in a national comparison of dentist-population ratios; however, of the remaining eight Western states, only two are above the national average. Furthermore, the average age of dentists in the West has been rising since the turn of the century, with a concentration of dentists in the older age groups. An American Dental Association study indicates that, on the average, dentists who are over 50 years old see fewer patients than do dentists in the 30-49 age group; and there is a further decline in average number of patients seen by the 60-69 age group, and again for dentists over 69. The rising average age of dentists also means higher demands in the next decade to replace dentists who leave active practice.

WHAT IS A SATISFACTORY DENTIST-POPULATION RATIO?

Dentistry differs from other health sciences in that dental disease never improves or cures itself if left alone; unless treated, the tendency is for deterioration and spread of the infection, so that the tremendous backlog of unmet needs has a very direct effect on present and future demands for the entire life span of our present population.

The backlog of dental care needs is great; it has been estimated that it would take more than twice the dentists in the United States ten years just to eliminate the backlog of common dental defects. There is a large volume of current dental disease in addition to this backlog. Actually, if all the people of the West were suddenly to seek the care they need, the dental profession would be overwhelmed. Surveys of present dentists indicate that many dentists are already working overly long hours, and many are turning away patients they do not have time to treat adequately.

Improved efficiency of dental treatment--through such technological advances as high speed engines and use of diamond stones and carbide steel cutting instruments, through advances in scientific knowledge concerning the cause and treatment of dental disease, and through use of trained auxiliary personnel--have already conserved the dentist's time. Further developments in these fields may be expected to save additional professional

time in the future. However, there is no indication of a future reduction in the over-all demand for dentists.

On the contrary, demands for dentists can reasonably be expected to increase substantially. This was the conclusion reached in a WICHE study of past trends, of factors influencing demand for dental services in each of the Western states--for example, the rising economic level, the greater degree of urbanization, the improved educational background of the population, and the greater availability of service--and of statistics on the incidence of dental disease. Even if fluorides were to have a much wider acceptance than at present, dental authorities question that the resulting reduction in dental caries would significantly affect the dental manpower needed in the West in the next decade. The actual demand for dental service today is far below what would be required to render all needed service; even with a reduction in dental caries, actual demand for services could be expected to rise.

Based on anticipated actual demand for dental services, the WICHE study projected the Western ratio for dentists at 80 dentists per 100,000 population, a ratio considerably above the West's 1958 ratio of 50 dentists per 100,000 population.

THE DENTISTS NEEDED BY 1970

Today, the West has 13,000 dentists. For 1970, it is estimated that 28,500 will be needed to meet the actual demand for dental services. Each year, an estimated average of 450 dentists become inactive, either because of retirement or death; over a 12-year period 5,200 new dentists will be needed as replacements, just to maintain the existing number of dentists. To meet the replacement demand and at the same time to raise the number of practicing dentists to 28,500 will require the addition of 20,500 new dentists, or 1,700 new dentists annually.

PRESENT EDUCATIONAL FACILITIES

The West now has six dental schools--four in California and one each in Oregon and Washington. Annual graduations from Western dental schools total 400, double the number a decade ago. Graduating classes range from 49 to 98, with an average class size of 65. None of the eight mountain states has a dental school; these states are completely dependent on schools outside the mountain region, and for the most part outside the West, for their dentists.

The West is the benefactor in a very favorable "balance of trade" in dental education. It is taking advantage of the generosity of the rest of the United States for educating a large part of its dental students. Of the 2,350 Western students enrolled in dental schools in 1958, 870--over 35 per cent--were attending dental schools outside the West. On the other

hand, Westerners accounted for almost 90 per cent of the enrollment of the Western dental schools; and a majority of the non-Westerners were concentrated in one private school. As indicated clearly in the catalogues of several of the Western schools, strong preference is given to in-state students and to those Western students covered by the WICHE Student Exchange Program. In 1958, 38 students attended Western dental schools under this program, which permits Western states without schools to reserve places for some of their students in the schools of other Western states.

Dentists tend to practice in the state in which they went to school. This tendency is particularly strong for graduates of Western dental schools. In the three Western states with dental schools, 74 per cent of the graduates have remained in the state in which they attended school; only eight per cent of the graduates of schools in the three West Coast states were located outside that three-state area in 1957. Of the dentists now practicing in California, 67 per cent are graduates of California schools; 80 per cent of Oregon's dentists are graduates of the Oregon dental school.

THE DENTAL MANPOWER OUTLOOK

If the present graduation rate is continued, Western schools will produce about one-quarter of the 1,700 new dentists needed annually. Some net in-migration of dentists to the area will probably continue. However, the shortage of dentists is expected to become more acute throughout the country; even with the expansions of dental education facilities now planned, not enough new dentists will be graduated in the United States to halt the downward trend in supply. As the more acute national shortage of dentists develops, the extent of Western in-migration may be reduced.

Another factor that may limit the future supply of new dentists in the West is the admissions policy of non-Western dental schools. If, as is already the case in medicine, the rest of the country follows the pattern of Western dental schools in limiting admission mainly to in-state students--a practice which may well be adopted as the shortage of dental education facilities becomes more acute nationally--the West stands to lose the equivalent of two and a half dental schools. In every field of higher education, in state after state, public universities are facing increasing pressure to restrict admissions to residents, and the existence of such restrictions can already be observed. Thus, it is reasonable to expect a relative reduction in the number of Westerners receiving an education in dentistry out of the region--a net rate now equivalent to 150 new dentists per year.

Western dental schools now graduate only 400 new dentists annually; some 200 Westerners graduate from non-Western schools each year and about 50 non-Westerners graduate from Western schools. If all of the Westerners who are new dental graduates set up practice in the West, only 550 new

dentists would be added each year. This is less than one-third the number needed to meet the anticipated demand for services and only two-thirds of the number needed to maintain the present dentist-population ratios. While some net in-migration is likely to continue, it will certainly not provide sufficient new dentists to make up the deficit.

AUXILIARY DENTAL PERSONNEL

There are several kinds of trained personnel to assist the dentist and permit him to use his time with optimal efficiency--the dental hygienist, the dental assistant, and the dental laboratory assistant. However, the training and use of such auxiliary personnel has been slow to develop. Although in some parts of the country the dental hygienists is fairly widely used, there are few hygienists in the West. Furthermore, there has been little demand for increasing training facilities for them, despite their obvious usefulness to the dentist--particularly in prophylaxis services.

The first, year-long dental hygiene training program was started in 1916. Today there are 34 such schools in the country, all of them with programs of at least two years and several with four-year baccalaureate programs. Many, but not all, of the dental hygienists programs are affiliated with dental schools. A few are independent schools; others are a part of a technical institute or a community college.

In 1955, there were 460 active dental hygienists in the West. Although no census has been taken since that time, there has probably been little increase in this total, since graduations have remained relatively constant, and the turnover in the profession is high.¹ Most dental hygienists are young women who remain in the labor market for a few years in their early twenties. Apparently thus far few dental hygienists have returned to active practice when their families are grown; on the other hand, there have not been concerted efforts to recruit inactive hygienists back into the labor market and to provide them with refresher training.

The use of dental hygienists in the West can be expected to increase, as dental students are taught the potentialities of the dental hygienists, and as more of them become available. A conservative estimate for the use of dental hygienists in the West a decade hence is 10 hygienists per 100 dentists, compared to the present rate of 4 per 100. The ratio of 10 per 100 is comparable to the ratio existing in seven states in the country in 1955; four states had ratios of 15 per 100 at that time. Thus, 10 per 100 is a conservative goal for the West for 1970.

¹A 1954 national inventory indicated that only half of the hygienists ever graduated were in practice at the end of five years following their graduation.

There are now four schools of dental hygiene in the West--two in California, one in Oregon, and one in Washington. The 1958 graduations totalled 83, a figure which has remained fairly constant for the last five years. At present, the cost to the student for her dental hygiene education is relatively expensive even at the three public universities with programs. In the Western schools, in-state tuition for a two-year program ranges from \$280 to \$1,146 at public institutions, and out-of-state tuition, from \$800 to \$1,692. The Student Exchange Program does not cover dental hygiene, although several states are considering this possibility.

An estimated total of 2,850 new hygienists must be added by 1970 to achieve a ratio of 10 hygienists per 100 dentists, given the present rate of replacement.¹ This means adding 250 new hygienists per year, or three times the present output of Western schools.

RECOMMENDATIONS

- ... To provide enough dentists for the West, taking into consideration some continued in-migration of dentists and a rising demand for dental services, the West will require an additional 1,260 graduations annually. This would mean a quadrupling of present capacity, or the equivalent of a dozen large dental schools. In the immediate future, existing dental schools should expand, and additional schools are needed.
- ... Because the practice of dentistry has changed markedly over the past decades and only a small proportion of dentists are recent graduates, continuation education programs for dentists are needed. Because many dentists in the West are situated at great distances from dental schools, efforts should be made by each state dental society to see that provision is made for continuation education programs that are accessible to as many dentists as possible.
- ... Efforts should be made to teach dentists more effective ways of using such auxiliary personnel as dental hygienists, dental assistants, and dental laboratory assistants, and training programs for such trained supporting personnel should be expanded.

¹If the employment pattern for dental hygienists changed, so that new graduates remained in the profession longer, or were attracted back to the profession after they had raised families, the high rate of replacement might be reduced substantially.

IV.

NURSES FOR THE WEST

The concept of nursing as a specialized function requiring specific preparation is less than one hundred years old. The first school of nursing education was established only 75 years ago--in 1873, under hospital auspices. The first school under college or university auspices was not established until 1909--36 years later, and no baccalaureate degree program in nursing was organized until 1916. Junior college nursing programs are a post-World War II development.

Along with all the professions, nursing has become increasingly differentiated in recent years. Nurses work directly with people who are ill, in hospitals and doctor's offices; they work as head nurses, public health nurses, and industrial nurses; and they work as supervisors and nurse administrators in public health and hospitals and as teachers of nursing. Because the functions of these three kinds of nurses are different, the National League for Nursing recommends a different educational background for each group.

<u>Positions</u>	<u>Recommended education</u>
For professional nurses who give direct care to patients under supervision. ...	A diploma from a hospital school program or associate-in-arts degree from a junior college program is recommended <u>minimum</u> preparation
For professional nursing personnel who hold positions ranging from hospital head nurse and public health staff nurse through service and education administrator. ...	A baccalaureate degree from 4 or 5-year collegiate degree program is recommended <u>minimum</u> preparation.

This chapter is based in part on Nurses for the West, Western Interstate Commission for Higher Education, 1959.

<u>Position</u>	<u>Recommended education</u>
For nurses who become teachers, supervisors, administrators and consultants. ...	A master's degree is recommended <u>minimum</u> preparation.

PRESENT SUPPLY OF NURSES

For the West, the 1957 ratio of 275 nurses per 100,000 population represents a drastic decline from the 1950 ratio of 318, during a period when the national nurse-population ratio increased substantially. This is the first time in many decades that the long-term Western trend of rising nurse-population ratios has been reversed. Furthermore, to speak in terms of an average for the West obscures the wide variation between states and the fact that three Western states are far below the national average and only two are above the basic recommended minimum of 300 nurses per 100,000 population.

The seriousness of the declining ratio is further indicated by the fact that graduations from Western nursing programs are dropping; graduations from beginning nursing courses are now 30 per cent below the 1946 level even though the population increased 42 per cent in this time.

Not only is the West already short in terms of absolute numbers of nurses, but many presently employed nurses do not have the educational preparation recommended for their jobs. For example, a master's degree is the recommended minimum preparation for directors of hospital nursing service, for nurse supervisors, and for teachers of nursing; and a baccalaureate degree is the recommended minimum preparation for head nurses. However, for the West, a diploma is the highest education for 15 of every 20 directors of hospital nursing service, for 18 of 20 nurse supervisors, and for 19 of 20 head nurses. In nursing school faculties in the West, one member in ten does not have a baccalaureate degree and six in ten do not hold an advanced college degree.

WHAT IS A SATISFACTORY NURSE-POPULATION RATIO?

Today's nurse-population ratio could be taken as a target for 1970. However, the National League for Nursing has set 300 nurses per 100,000 population as a recommended minimum for adequate nursing service today. It considers the ratio of 350 nurses per 100,000 population more adequate for today's nursing needs. These ratios are based on the number of employed registered nurses (R.N.'s) needed to perform duties that should be carried out by professional nurses and not delegated to such supporting personnel as practical nurses, orderlies and aides.

In choosing a nurse-population ratio to set as a target, several factors should be taken into account. The present ratio of nurses to population apparently is already inadequate. Shortages of nurses are reported

throughout the West; and from time to time there are reports of needed wards in Western hospitals being closed because of shortages of staff nurses.

Although the ratio of 300 nurses per 100,000 population is recognized as conservative in terms of today's health needs, and still more conservative in terms of future needs since it does not take into account probable increases in demands for nursing service, in this report estimates for the nurses needed are based on this recommended minimum.¹

THE NURSES NEEDED BY 1970

In any given year, of every 100 nurses working, five will leave the labor market because of death or retirement and must be replaced in order to maintain the present number of active nurses. For the West, the replacement demand is 3,400 additional nurses a year or 40,900 nurses for the 12-year period.

To keep pace with the population growth of the West and to achieve a 300 nurse per 100,000 population ratio, a total of 78,000 additional nurses must be added, that is, 11 new nurses for every 10 nurses now employed. Of these, a total of 52,000 should have at least a junior college or diploma education and 26,000, at least, a baccalaureate degree. In addition, 10,400 nurses with a B.S. degree should obtain a master's degree. This means that each year, we should add a total of 6,500 nurses, of whom 4,350 have a junior college or diploma education, and 2,150 a baccalaureate degree. In addition, 850 nurses are needed who go on for a master's degree.

PRESENT EDUCATIONAL FACILITIES

In the West, in 1958 there were 107 schools giving basic or beginning nursing programs; of these, 17 were junior college programs, 57 were hospital school programs, 33 were basic collegiate programs.² At the graduate level, eight schools had master's programs and one school began an organized two-year, post-master's (non-degree) program in 1959. At present, there are no doctoral programs specifically designed for nursing, although the need for such programs is recognized by nurse educators.

¹However, it is assumed that the two states now exceeding this ratio--Colorado and Montana--will want to maintain their present ratios. Nurses for the West also includes detailed estimates based on maintaining present ratios and on achieving a 350 nurse per 100,000 population ratio.

²In addition, four collegiate schools did not give basic undergraduate nursing programs but offered only a baccalaureate program for registered nurses.

1956-57 graduations from Western schools of nursing were:

Beginning nursing programs		2,403
Junior college and diploma programs	1,830	
Baccalaureate programs	573	
Baccalaureate programs for RN's		308
Master's programs		79

At each educational level, the West is now educating less than half the nurses it needs just to maintain the present nurse-population ratio. It is not educating enough nurses even to replace normal drop-outs in the present labor force. And it is educating only one-third the nurses needed to achieve a 300 nurse-population ratio. Continuation education programs for nurses in administrative, supervisory, and teaching positions have been started under the sponsorship of WICHE. It is hoped that this continuation program will continue on an expanded basis to reach an even larger number of such nurses.

THE NURSING MANPOWER OUTLOOK

To achieve a 300 nurse per 100,000 population ratio will require additional graduations of 2,600 annually at the diploma school or junior college level, 1,250 additional graduations at the baccalaureate level, and 750 additional graduations at the master's level above the present graduation rate.

In the past, nursing education has been organized primarily under the auspices of a large number of individual hospitals, with many extremely small schools. Between 1948 and 1959, over one-third of the Western hospital schools of nursing had closed, and only two new programs were started, leaving 57 hospital schools; this closing of schools is reflected in the over-all drop in total enrollments of beginning nursing programs--from 12,400 in 1946 to 10,300 in 1957--despite major increases in junior college and baccalaureate program enrollments during these years.

While privately supported diploma (hospital school) programs were decreasing, the relatively new junior college programs have been growing rapidly. By September 1959, there were 19 junior college nursing programs, none of which is as much as ten years old. In 1957, the enrollment of the 17 programs then operating totalled 615.

There have been a number of new baccalaureate programs in nursing started within the last ten years, and existing programs have expanded. Enrollment in baccalaureate programs increased 46 per cent in just the four-year period from 1953 to 1957.

In view of the decline in the programs in hospital schools at a time when junior college and baccalaureate programs increased and expanded, it seems likely that the private hospital schools will not be able to

handle any substantial amount of the major increases in nurse education programs so urgently needed. On the other hand, existing junior college and baccalaureate programs can expand substantially, given the necessary financial support.

At the graduate level, eight of the 37 collegiate schools of nursing now have master's programs. Eight additional schools report that such programs are under consideration. One newly organized post-master's non-degree program may develop into a doctoral program in a few years. However, even if existing programs are expanded and the new ones that are in the planning stages all develop, facilities for students will still not be adequate.

RECOMMENDATIONS

- ... Existing junior college and baccalaureate programs should expand, and should be given the financial support necessary to such expansion. Because they are so new, most junior college programs have not reached maximum capacity. However, because of the nature and location of the junior colleges, such nursing programs will probably remain smaller than baccalaureate programs. Capacity of existing junior colleges should be increased to an average graduating class of 50. Most existing baccalaureate programs should expand substantially, though some of the larger schools may be closer to maximum potential undergraduate enrollment than smaller schools. On the average, existing baccalaureate schools should double graduations in the coming decade.
- ... Even if the existing junior college and baccalaureate programs expand as recommended, and diploma programs hold their own, there will still be a deficit of 2050 graduations at the junior college and diploma level and of 350 at the baccalaureate level. New junior college and baccalaureate programs are needed.
- ... Existing graduate programs cannot handle the demands for qualified nurse administrators, supervisors, and teachers for the West in the coming years. At the master's level, large-scale expansion of existing programs is needed. Also every college with a baccalaureate program that does not now offer a master's program should consider its responsibility in graduate nursing education and determine whether it should be starting such a program. Doctoral programs are needed for nurse teachers and other nurses in the top leadership positions.

These master's and post-master's programs are of particular importance because they supply the key nursing school personnel--the teachers and the supervisors and administrators in clinical areas used by the school--to permit expansion of the basic nursing programs.

... Additional continuation education programs are needed to help nurses bring themselves up to date on new developments and to better prepare themselves for their present jobs and for assuming more responsible jobs. Refresher training is needed to prepare inactive nurses to return to active status.

V.

VETERINARIANS FOR THE WEST

Veterinary medicine is basic to the public health and economy of the states of the West. It is the veterinarian who insures the health of the livestock, a critical factor in the economy of the West. More than 80 diseases are transmissible from animal to man; through prevention and control of such animal disease in the West, the veterinarian safeguards the nation's food supply.

Since the first privately financed veterinary medicine education began in the United States in 1852, with practice based largely on home remedies, it has developed into a recognized educational program of professional stature. Today, education in veterinary medicine requires a minimum of two years of pre-veterinary college study and four years of professional study for the D.V.M. degree.

PRESENT SUPPLY OF VETERINARIANS

The number of veterinarians in the West has been increasing steadily. In 1958, the West had 3,300 veterinarians, more than double the number in 1940. This is an increase not only in terms of absolute numbers of veterinarians but also in relative terms; the West has gone from 9 veterinarians per 100,000 population in 1940 to 13 per 100,000 population in 1958. A majority of the veterinarians presently practicing in the West were educated in Western schools.

This chapter is based in part on Veterinary Medicine in the West, Western Interstate Commission for Higher Education, 1958.

WHAT IS A SATISFACTORY VETERINARIAN-POPULATION RATIO?

There is no single standard for measuring the adequacy of the supply of veterinarians. The economy of a particular area determines the use of and the need for veterinarians, whether in small animal practice, large animal practice, inspection, teaching and research, and government positions. However, taking into consideration the ratio of veterinarians to population and to the value of livestock, and the considered judgment of persons in the profession, it appears that the West now has a relatively favorable manpower situation in veterinary medicine, except in the fields of teaching, research, and public health.

THE VETERINARIANS NEEDED BY 1970

To maintain the present ratio of veterinarians to population, by 1970 the West will need a total of 4,500 veterinarians. To achieve this, it must add a total of 2,500 veterinarians, or an average of 200 annually.

PRESENT EDUCATIONAL FACILITIES

There are now three schools of veterinary medicine in the West--in Colorado, Washington, and a relatively new one in California. The annual graduation rate from these schools has been stabilized at 150 for the last half dozen years.

The Western states without schools of veterinary medicine are currently taking some steps to provide for the education of their students through the WICHE Student Exchange Program. For the current academic year, over 100 students from eight of the Western states without veterinary medical schools are being educated under the Exchange Program. However, although the Program has been expanded somewhat over the years, it still does not cover all students from these states who are attending out-of-state Western schools of veterinary medicine.

THE VETERINARY MEDICINE OUTLOOK

Although graduations from Western veterinary medicine schools fall somewhat short of the annual demand for new veterinarians, a continuation of the net in-migration of past years is expected to bring the supply of new veterinarians in the region up to the number needed to maintain the present ratio of veterinarians to population. Thus, no grave shortages of undergraduate veterinary medicine facilities are anticipated. However, states without schools can expect to find it increasingly difficult for their students to gain admission to schools in other states.

There is already a shortage--and one that may become more acute--at the graduate level in veterinary medicine. In teaching and research,

there is a shortage of trained personnel. Furthermore, not enough research is being conducted in veterinary medicine.

RECOMMENDATIONS

- ... It is important that states without schools guarantee the opportunity to study veterinary medicine to their residents by increasing the number of students provided for under the Exchange Program. Present quotas are inadequate for two reasons. First, they will not provide the sending states with enough veterinarians for the future years, and unless the quotas are increased, the students not covered may find it increasingly difficult to gain admission to the Western schools. And second, the states without schools are not shouldering their fair share of the cost of education for a large part of their veterinary medicine students attending out-of-state Western schools. The education of these students is now being paid for in large part by the taxes of residents of the states with schools.
- ... Facilities and programs for graduate education must be expanded, in order to increase the supply of trained personnel for teaching and research.

VI.

MENTAL HEALTH PERSONNEL FOR THE WEST

Mental health activities and the availability of trained mental health personnel are direct concerns of state governments. A large number of their citizens are in mental institutions, and most of the institutions are publicly supported ones. The well-being and the chances of recovery of these patients is dependent in large part on the kind of professional treatment given; when the institutions are poorly staffed, the recovery rate of the patients is considerably reduced. Thus, in considering mental health personnel, we are speaking in large part of personnel to man public institutions and clinics--of personnel needed to speed the recovery or rehabilitation of the 85,000 Westerners now in mental hospitals and institutions for the mentally defective and epileptic --of personnel to man a major governmental activity--that is generally one of the two top users of the State's general fund.

Mental health services demand a variety of highly specialized professional skills as well as several kinds of supporting skills. The mental health professions include psychiatry, clinical psychology, social work, physical, occupational, and rehabilitation therapy, and psychiatric nursing.

Training for several of these mental health professions is given at the graduate and postgraduate level; psychiatry is built on medicine, psychiatric nursing on undergraduate collegiate nursing programs, social work and clinical psychology on undergraduate liberal arts courses. And so the supply of mental health personnel is directly dependent on the number of graduates of medical schools, collegiate nursing schools, and liberal arts colleges. It will not be possible to increase the number of psychiatrists substantially without increasing the number of medical school

This chapter is based in part on the WICHE study Mental Health Training and Research in the Western Region, 1956.

graduates; in the same way, increasing the supply of clinical psychologists and social workers is dependent on the availability of a reservoir of college graduates from which these can be drawn, as well as on the availability of the specific graduate training programs.

THE PRESENT SUPPLY OF MENTAL HEALTH PERSONNEL¹

Mental health personnel work in public institutions and clinics. But this is not the sole outlet for their services. They are also found in state and local departments of public health and mental hygiene, in voluntary community agencies, in private hospitals, and in private practice. For example, one third of the psychiatrists limit their work largely to private practice and another third divide their time between private practice and institutional or clinical work. Thus, the public institutional and clinical needs for mental health personnel constitute only a part of the demand.

Mental hospitals

Today, the West is experiencing a critical shortage of mental health facilities and personnel. We do not have enough suitable mental hospital beds or clinics in the West. And those we have are badly understaffed.

The American Psychiatric Association has set minimum standards for staffing of mental hospitals in terms of psychiatrists, psychologists, social workers, registered nurses, and attendants. As indicated in Table 1 and Table 2, the West's public mental hospitals are far below these minimum standards for every kind of personnel. Western public mental hospitals have only one half the physicians, two thirds the psychologists, one half the social workers, and one fifth the registered nurses they should have (see Table 3). Not only are there too few jobs budgeted, but many institutions are unable to fill all their jobs (see Table 4).

Yet the shortage is even greater than these data indicate. The American Psychiatric Association standards used for comparison are only minimum standards. Furthermore, they are stated only in quantitative terms;

¹Additional state-by-state data on mental hospitals and clinics can be found in Appendix, Mental Health Manpower Trends, by George Albee, Monograph Series No. 3, Joint Commission on Mental Illness and Health. (New York, Basic Books, 1959); and Fifteen Indices: An Aid to Reviewing State and Local Mental Health and Hospital Programs, Joint Information Service of the American Psychiatric Association and the National Association for Mental Health. (Washington, D. C.: Joint Information Service, 1700 Eighteenth St., N.W., January, 1960).

Table 1

SELECTED CURRENT DATA ON MENTAL HEALTH SERVICES

	Per cent adequacy of physician staff based on APA*stan- dards, 1958	Average daily maintenance expenditure for patient in public mental hos- pital, 1958	Number of psychia- trists per 100,000 population, 1959	Professional man-hours in outpatient clinics per week per 100,000 population, 1959
ARIZONA	42.1%	\$4.24	3.2	61.8
CALIFORNIA	82.7	5.08	9.0	160.7
COLORADO	80.0	4.72	6.4	121.9
IDAHO	61.5	4.47	2.3	15.2
MONTANA	23.8	3.66	2.0	34.3
NEVADA	50.0	4.27	1.8	162.1
NEW MEXICO	45.5	4.91	1.8	17.9
OREGON	54.1	3.87	3.2	57.6
UTAH	31.3	3.45	4.7	84.5
WASHINGTON	54.2	4.28	4.5	97.2
WYOMING	42.9	3.71	2.5	10.3
KANSAS**	196.0	6.15	10.3	265.3

* American Psychiatric Association

** Data on Kansas are given for purposes of comparison since Kansas is now in its second decade of a vigorous training and research program, and with increased staff it has made tremendous progress in treatment and rehabilitation of the mentally ill.

Source Fifteen Indices: An Aid in Reviewing State and Local Mental Health and Hospital Programs.

Table 2

RATIO OF PATIENTS TO PERSONNEL IN WESTERN PUBLIC MENTAL HOSPITALS, 1956

	Physician	Psychologist	R.N.	Attendant	Social Worker*
APA standard	30:1 adm. 150:1 cont. tr. 150:1 geriat. 50:1 M. & S. 50:1 TB	100:1 500:1	5:1 40:1 20:1 5:1 5:1	4:1 6:1 4:1 5:1 5:1	
ARIZONA	186	835	104	5.5	281
CALIFORNIA	140	606	110	6.0	90
COLORADO	105	1,424	74	6.0	319
IDAHO	307	245	102	6.4	179
MONTANA	238	635	112	6.0	423
NEVADA	223	446	89	8.6	-
NEW MEXICO	199	498	142	4.1	246
OREGON	198	1,239	88	5.3	678
UTAH	261	326	118	4.8	155
WASHINGTON	212	1,203	154	5.2	384
WYOMING	652	217	93	10.5	79

* 80:1 new admissions per year; 60:1 convalescent or family care patients;
1 supervisor per 5 case workers.

Source: Mental Health Manpower Trends, George W. Albee.

Table 3

ADEQUACY OF STAFF OF PUBLIC MENTAL HOSPITALS IN THE WEST,
COMPARED WITH THE AMERICAN PSYCHIATRIC ASSOCIATION MINIMUM STANDARDS 1956

	Physicians			Psychologists			Social workers			Registered Nurses			Other nursing personnel		
	No. needed	No. employed	Per cent adequacy	No. needed	No. employed	Per cent adequacy	No. needed	No. employed	Per cent adequacy	No. needed	No. employed	Per cent adequacy	No. needed	No. employed	Per cent adequacy
Arizona	20	9	45	3	2	67	19	4	21	111	16	14	334	302	90
California	444	265	60	74	61	82	370	240	65	2467	337	14	7400	6197	84
Colorado	68	54	79	11	4	36	43	8	19	380	77	20	1139	943	83
Idaho	15	4	27	3	5	167	18	6	33	82	12	15	245	192	78
Montana	23	8	35	4	3	75	22	3	14	127	17	13	381	315	83
Nevada	5	2	40	1	-	-	5	0	0	30	5	17	89	52	58
New Mexico	12	5	42	2	2	100	23	5	22	66	7	11	199	243	122
Oregon	59	25	42	10	4	40	58	5	9	330	56	17	991	944	95
Utah	16	5	31	3	4	133	11	4	36	87	11	13	261	274	105
Washington	87	34	39	14	6	43	47	7	15	481	47	10	1443	1383	96
Wyoming	8	1	12	1	3	300	4	3	75	93	7	16	130	62	48
The West	757	412	54	126	94	75	620	285	46	4254	592	14	12612	10907	86

Source: George W. Albee, Mental Health Manpower Trends.

Table 4

UNFILLED POSITIONS AS A PER CENT OF TOTAL POSITIONS BUDGETED
AT WESTERN STATE MENTAL HOSPITALS, 1956

	<u>Physicians</u>	<u>Psychologists and Psychometrists</u>	<u>Registered Nurses</u>
ARIZONA	10%	0%	20%
CALIFORNIA	14	7	10
COLORADO	39	83	55
IDAHO	45	37	20
MONTANA	31	25	22
NEVADA	-	-	17
NEW MEXICO	44	60	22
OREGON	8	43	24
UTAH	43	20	45
WASHINGTON	36	25	24
WYOMING	50	0	0
THE WEST	21	20	17
U.S.	23	23	21

Source: Mental Health Manpower Trends, George W. Albee.

they do not measure the adequacy of the educational background of the employees in each of these categories. Of the incumbents in positions in public mental hospitals, many do not have the educational background that is considered desirable for the position. For example, there are state hospitals where the physicians doing psychiatric work have not had psychiatric training; where the registered nurses have not had specific training for psychiatric nursing; where the persons holding social work positions have not had adequate social work training; and where the psychiatric aides and attendants--the persons who have the most frequent day-to-day contacts with the mentally ill patients--have had no formal pre-service or in-service training which might give them the skills and insights needed in modern treatment of the mentally ill.

Psychiatric clinics

In addition to mental hospitals, an essential public facility for work with the mentally ill and emotionally disturbed is the community-based psychiatric clinic. At present many Western counties have no psychiatric service at all (see Table 1). In seven inter-mountain states four of every five counties have no psychiatric service at all.

New York State estimates that a three-man team is needed for public clinic services to each 50,000 population. In the West, to achieve a standard of even a 3.5 person clinic per 100,000 population¹ would require the addition of some 200 professional staff persons.

Institutions for the mentally retarded

At present, there are 19,000 persons in Western institutions for the mentally deficient and epileptic. The aim of the modern institution for the retarded should be to assist the patient in achieving maximum social, emotional, and intellectual maturation. This requires skilled mental health personnel, including psychiatrists, nurses, psychologists, social workers, and special educators. As is the case with mental hospitals, many of our Western institutions for the retarded have long waiting lists and are understaffed. Thus, these institutions, too, compete for scarce mental health personnel.

Clearly, the West has too few suitable facilities for treating the mentally ill and the mentally retarded. Those it does have are understaffed. And the staffs they do have may lack sufficient training in mental health skills. As a result, the Western states are not able to use all the knowledge and treatment techniques available to modern society to help their mentally ill citizens toward recovery.

¹The equivalent of 140 professional man-hours per week per 100,000 population.

WHAT ARE SATISFACTORY STANDARDS FOR MENTAL HEALTH PERSONNEL

In 1956, the American Psychiatric Association set the following minimum standards for staffing mental hospitals;¹ these are currently being re-examined and revised upward:

	<u>Admission and intensive treatment</u>	<u>Continued treatment</u>	<u>Geriatric service</u>	<u>Medical and surgical</u>	<u>Tubercu- losis service</u>
Physicians per patient	1:30	1:150	1:150	1:50	1:50
Clinical psychologists per patient	1:100	1:500	--	--	--
Registered nurses per patient	1:5	1:40	1:20	1:5	1:5
Attendants per patient	1:4	1:6	1:4	1:5	1:5
Social workers	1:80 new admissions per year; 1:60 patients on convalescent status or on family care; 1 super- visor to every 5 case workers.				

In summary terms this means: 1 physician per 94-98 patients.

1 clinical psychologist per 400-500 patients.

1 registered nurse per 15 patients.

1 other staff member (nurse or attendant)
per 5 patients.

Furthermore, mental health personnel are needed for institutions for the mentally retarded, and for clinical services at the community level, and psychiatrists and psychologists are needed for private practice.

PRESENT EDUCATIONAL FACILITIES

Graduate programs

Graduate programs in the mental health specialties in the West include: 32 residency programs in psychiatry, 20 of them are full three-year programs; 6 programs in social work; 4 programs in psychiatric nursing; and 9 programs in clinical psychology. Several of these programs are relatively new, and the size of others has been increased in recent years.

Although current data on output of these programs are incomplete, their inadequacy is indicated by the fact that--even though Veterans'

¹Standards for hospitals and clinics, American Psychiatric Association, 1956.

Administration hospitals fall short of the APA staffing standards--with our present Western training programs it would take: 29 years to train enough psychiatrists to bring state institutions up to the standard of the VA hospitals; for clinical psychologists, it would take 21 years; and for social workers it would take 9 years. And this still ignores the needs for additional personnel to provide acceptable staffing standards for clinics, the needs for the additional institutional and clinical facilities we should have to serve our present population, and the needs that will be created by the addition of 9 million new Westerns by 1970.

Even though training facilities are inadequate to provide the skilled personnel needed in mental health work, not all existing training openings are filled. This reflects the fact that not enough students are being graduated from basic professional programs, that recruitment in mental health is inadequate, and that job opportunities are not sufficiently attractive to obtain the needed personnel.

Continuation education

In addition to the regular professional training courses, there are several current efforts in continuation education, under the sponsorship of WICHE:¹

In several areas of the region, series of seminars are being organized for postgraduate psychiatric education, to bring psychiatric knowledge and skills to physicians in the community, since all members of the medical profession are in the front line in mental health.

A career training program for top staff members of Western public institutions for the mentally retarded has been started at Pacific State Hospital in California. Trainees, sponsored by their states, remain on their home institution's payroll while they participate.

In-service training for psychiatric nursing personnel--for registered nurses, practical nurses, and psychiatric aides and attendants--is receiving increased attention. At the suggestion of the superintendents of the Western state hospitals for the mentally ill and institutions for the retarded, a regional workshop on in-service training for psychiatric nursing personnel is being held in the spring of 1960 to improve institutional in-service training efforts in the region.

THE MENTAL HEALTH MANPOWER OUTLOOK

Throughout the United States, there are severe manpower shortages in all the disciplines involved in mental health work. Experts anticipate

¹More detailed information on these programs is included in Opportunity in the West, the WICHE 1959 Annual Report.

that these shortages will become even more acute as our population increases rapidly over the coming years. In the West, as elsewhere in the nation, the training facilities for mental health personnel have expanded considerably since World War II. Nonetheless, the current shortages are severe and are expected to become more so.

Experiments have indicated that intensive psychiatric treatment pays off in dramatic fashion in terms of incidence of recovery of the mentally ill. Furthermore, there is greater insistence that programs for the mentally ill should no longer be of a custodial type. Both public and private hospitals are moving away from a custodial towards a treatment and rehabilitation orientation. Furthermore, there is greater emphasis on community programs for early treatment, rehabilitation, and prevention of mental illness, and for positive steps for promotion of mental health. But modernization of mental health programs requires major manpower increases in all mental health disciplines.

A major obstacle in expanding mental health education programs is recruitment. Because this has been recognized as a critical problem, WICHE is sponsoring a pilot summer internship program in 1960, to attract able college students to the mental health professions. The program, directed by the University of Colorado in cooperation with the Colorado Department of Institutions, the Colorado Mental Health Association, and a half-dozen participating Colorado institutions, will introduce selected students to the mental health field through carefully supervised field placement in paying summer jobs in mental hospitals or other public facilities while the students are earning course credit in the University's Department of Sociology. If this pilot program is successful, it is hoped that this approach will be extended to cover a larger number of students in other collegiate summer programs in the West.

RECOMMENDATIONS

Several kinds of action are needed to meet the shortage of personnel in mental health--better use of personnel, up-grading of personnel, improved recruitment and employment practices, and coordinated realistic planning:

- ... Better use should be made of existing personnel and skills. For example, it is hoped that the pilot program for psychiatric training for general practitioners, surgeons, and other physicians will be expanded so that every medical society in the West supports such a program.
- ... Skills of present personnel should be upgraded through continuation education programs.
- ... Present educational facilities should be expanded in the light of a realistic appraisal of the mental health needs of the state and

region; consideration should be given to expanding and finding new ways for interstate cooperation and sharing of education facilities in mental health education.

- ... New kinds of selective recruitment efforts are needed to attract competent people into the mental health professions.
- ... Systematic programs are needed to make mental health employment more attractive, as for example, better working conditions, provision for growth of professional self and for professional advancement, and salaries commensurate with training and responsibility.
- ... Systematic planning for mental health education is dependent on up-to-date and accurate information, information not currently available. A continuous inventory is needed on mental health personnel and on capacity and output of mental health training facilities in the West.

These six steps are basic to improving the manpower situation in mental health. But at least as important as these is increasing the basic collegiate programs on which mental health draws--programs in medicine, nursing, and psychology in particular. Without an adequate pool of trained personnel to recruit from, mental health cannot hope to solve its manpower problems.

VII.

PUBLIC HEALTH PERSONNEL FOR THE WEST

As the population has been increasingly concentrated in urban areas, and as new areas of health needs have arisen or been identified, public health functions have broadened. Public health includes a wide variety of professions; it includes some 30 different disciplines, including such diverse ones as sanitary engineering, school health education, public health medicine, public health nursing, food and drug inspection, and radiation engineering.

As stated in the Medical School Inquiry:¹

The problems of controlling radiological hazards, air pollution, hazards of mining and chemical manufacturing industries, the protection of pure water supplies, and the conservation of the health of babies and children, are among the other areas included in the training provided by schools of public health.

A school of public health trains doctors, nurses, engineers, and other professional health workers to identify diseases and health hazards affecting the community, to find their causes, and to develop control methods.

A good public health worker must have, in addition to his basic skill in such a field as medicine, nursing, or engineering, the knowledge of how to apply his particular discipline to solving community health problems. The fundamental education of a physician, for instance, teaches him to diagnose and treat the ills of the individual patient. A different approach is required if he is to work in the field of public health. Here he must

¹Medical School Inquiry, Staff Report to the Committee on Interstate and Foreign Commerce, House of Representatives, 85th Congress, 1st Session, 1957.

recognize the processes by which diseases affect the well-being of the whole community rather than of specific individuals, and mobilize the resources of the community to bear on its problems.

The current and future importance of public health activities is indicated by the serious implications involved in radioactive fall-out, the increasing use of insecticides, and the problems involved in the disposal of radioactive and other industrial wastes. There has even been reference to the possibility that man might commit "species suicide" as a result of the chemical, radiological, and other pollutants he has produced unless prompt and adequate public health measures are taken.

Such new problems in environmental health create an urgent need not only for more trained personnel, but also for further training of personnel educated in past years, since many of the problems dealt with in public health today did not exist ten or twenty years ago, and many of the methods of working with old problems have changed.

Graduates of public health programs are generally employed by governmental agencies. Of every ten persons employed in public health work in the United States, six are in state and local health agencies, and two are in school systems; the remainder are employed by other state departments, by the federal public health agencies, by visiting nurse associations, and by voluntary health associations.

PRESENT SUPPLY OF PUBLIC HEALTH PERSONNEL

Many areas in the West--particularly in the Mountain region--do not have full-time organized local health services; one Westerner in every ten is not protected by organized local public health services (see Table 1).

Table 1

PER CENT OF POPULATION OF WESTERN STATES NOT COVERED BY ORGANIZED PUBLIC HEALTH SERVICES, EITHER THROUGH A COUNTY OR CITY HEALTH DEPARTMENT OR STATE OR LOCAL HEALTH DISTRICT, 1958

<u>State</u>	<u>Per cent of population</u>
Arizona	15
California	2
Colorado	20
Idaho	37
Montana	81
Nevada	28
New Mexico	0
Oregon	16
Utah	0
Washington	0
Wyoming	82
The West	9

Source: Organization and Staffing for Local Health Services, January 1, 1958.
U. S. Department of Health, Education and Welfare

As of January 1958, local and state health departments in the 11 Western states employed 5,400 full-time professional employees (see Table 2). According to a survey by the U. S. Department of Health, Education, and Welfare, 4,400 of these employees should have had one year of public health training; however, 40 per cent of those needing training had not had it. In addition, there were almost 500 unfilled positions in these Western state and local health departments; a year of public health training is desirable in 80 per cent of these unfilled positions (see Table 3). This means that in the West today there is a backlog of training needs in public health of over 2,000 people; yet during the academic year 1958-59, only 173 Westerners were taking the needed year of professional training at schools of public health in the nation.

Table 2

NUMBER OF FULL-TIME PROFESSIONAL EMPLOYEES IN WESTERN STATE AND LOCAL PUBLIC HEALTH AGENCIES AND THEIR PUBLIC HEALTH TRAINING AS OF JANUARY, 1958 AND NUMBER OF STUDENTS FROM EACH STATE ATTENDING A SCHOOL OF PUBLIC HEALTH IN 1958-59

State	Full-time professional employees, Jan. 1958						Number of students from state in schools of public health 1958-59
	Total	Those who should have 1 yr. P.H.trg.				Total	
		Those with training		Those without training			
		No.	Per cent	No.	Per cent		
Arizona	135	99	49	49	50	51	9
California	3052	2490	1615	65	875	35	120
Colorado	395	313	191	61	122	39	6
Idaho	137	129	50	39	79	61	3
Montana	117	106	52	49	54	51	5
Nevada	58	58	25	43	33	57	1
New Mexico	153	153	70	46	83	54	8
Oregon	350	331	225	68	106	32	9
Utah	245	180	97	54	83	46	2
Washington	693	505	343	68	162	32	9
Wyoming	45	43	31	72	12	28	1
TOTAL	5380	4407	2748	62	1659	38	173

Source: Data on employees obtained from a tabulation by the U. S. Department of Health, Education, and Welfare.
Data on students in schools of public health obtained from the American Public Health Association.

Thus, many Westerners do not receive any local public health services; for those areas of the West that have local public health services, not all the budgeted positions in public health agencies are filled, and of those filled, not all incumbents have had the recommended year of public health training.

Table 3

TOTAL NUMBER OF UNFILLED POSITIONS IN WESTERN STATE AND LOCAL HEALTH AGENCIES AND NUMBER FOR WHICH PUBLIC HEALTH TRAINING IS DESIRABLE
JANUARY 1, 1958

	Total Positions unfilled	Unfilled Positions for which employee should have public health training*
Arizona	6	5
California	307	233
Colorado	30	24
Idaho	15	15
Montana	22	19
Nevada	7	7
New Mexico	18	15
Oregon	26	26
Utah	28	23
Washington	29	18
Wyoming	5	4
TOTAL	493	389

*At least one year of professional public health training desirable, irrespective of whether the training is required as a condition of employment.

Source: Tabulation by the U. S. Department of Health, Education, and Welfare.

WHAT IS A SATISFACTORY RATIO OF PUBLIC HEALTH PERSONNEL TO POPULATION?

There is no one precise formula for determining what is adequate public health service, or how much professional personnel is needed to provide adequate public health service, but there is general agreement that all areas of every state should have local public health services. Modern public health practice recommends that estimates of the needs for public health personnel be based on the unique circumstances of the individual area being considered, on its characteristics, and on the other

resources available in the community. Unfortunately, no such estimates are available for the West as a whole for the coming decade. However, there are several ratios that have been used in past years that give a general idea of public health personnel needs; while estimates based on such uniform ratios are less refined than estimates based on individualized studies, nonetheless they may give an indication of the magnitude of the public health manpower problem.

These recommended ratios are:

- 1 public health physician per 50,000 population.
- 1 public health nurse per 5,000 population.
- 1 public health sanitarian per 15,000 population.

PUBLIC HEALTH PERSONNEL NEEDED BY 1970

To maintain the present number of professional persons in public health jobs in the West by 1970 will require replacing 2600 persons now employed in public health who will leave active employment. Of these replacements, 82 per cent--2,100--will be in jobs that require at least a year of public health training. This includes 175 new physicians, 1200 new nurses and 550 new sanitarians.¹

If we are to raise the public health services to the recommended ratios for public health physicians, nurses, and sanitarians, as well as take care of the additional population that the West will have by 1970, we will need 500 additional public health physicians, 1700 additional public health sanitarians, and 5500 additional public nurses for the 12-year period. This means an annual increment of 40 public health physicians, 140 public health sanitarians, and 460 public health nurses each year or an annual total of 640 new people in these three professions alone. And this estimate does not include the need for such other public health professionals as clinic nurses, dentists, dental hygienists, engineers, laboratory personnel, health educators, nutritionists, social workers, psychologists, statisticians, veterinarians, speech and hearing therapists.

PRESENT EDUCATION FACILITIES

The schools of public health are the major source in public health graduate education. It is difficult to pinpoint the other educational

¹Estimates on need for training for a 5-year period 1957-62 are included in the Sourcebook for the National Conference on Public Health Training, July 28-30, 1958, U.S. Department of Health, Education, and Welfare. The estimates included in the Sourcebook are based on in-service training needs and do not take into account pre-service training needs. They give a good indication of in-service education needs of local and state health departments for this 5-year period.

facilities available in public health, since some public health training is given in schools of nursing, collegiate departments of sanitary engineering, sanitary science, and public health nutrition, and schools offering programs for social work in public health; however, only part of the graduates of these schools go into public health work.¹

There are currently 11 accredited schools of public health in the United States, only one of which--the University of California's school at Berkeley--is West of the Mississippi. In 1958, the California school awarded 107 master's degrees in public health. Of the 165 students registered in 1958-59, a little more than half were from California; eight of the other Western states accounted for 14 of the 107 graduating students.

(A second Western school of public health, the relatively new School of Public Health of the University of California at Los Angeles, has recently applied for accreditation, and accreditation may be expected soon.² Within the next several years this school should make a major contribution to public health education in the West.)

Students at schools of public health generally come from the entire country, thus the California school is not the sole educational facility training Westerners in public health. However, there is a critical national shortage in public health education facilities. In 1957-58, enrollment (in terms of the full-time equivalent) totaled only 1,068 for all 11 schools of public health in the country; and many of these students were already in the armed forces or the Public Health Service, or were foreign students who will not be employed in the United States upon graduation.

The federal Public Law 911 Traineeship Program has stimulated enrollments in schools of public health. For example, at California, the number of master's degrees in public health increased from 72 in 1956 to

¹Some collegiate schools of nursing already give public health training that is comparable to the year of public health training recommended for public health nurses. By 1963, all accredited collegiate schools of nursing (baccalaureate programs) will include such training in their regular curriculum. However, as of 1957, only one in five nurses graduating from beginning programs in nursing were in baccalaureate programs, and, of course, not all such graduates go into public health work.

²Because it is not yet accredited, this school has granted only Master of Science degrees to date. This is a more research-oriented degree than the Master of Public Health, the customary degree for the public health professional who is not in a research position. Furthermore, until the school is accredited, its students are not eligible for federal traineeship program grants. This may tend to restrict its enrollment till accreditation is received.

107 in 1958. This increase is of particular significance, since between 1946 and 1955 the number of public health trainees in the nation's schools had dropped 50 per cent.

The field of public health is changing so rapidly that new information and techniques are constantly being introduced. As a result, it is important that those persons who have had the year of public health training be kept currently informed of new developments in their field. To meet this need, the school of Public Health at the University of California and the Western Regional Office of the American Public Health Association recently inaugurated a program of continuation education in public health, available to public health agencies in the 13 Western states. The institutes, workshops, and seminars held under this program must be self-supporting.

THE PUBLIC HEALTH MANPOWER OUTLOOK

The 1958 National Conference on Public Health Training concluded that "an emergency still exists in the national shortage in trained professional public health personnel." The Conference estimated that the backlog of known current needs for training in public health in the United States at this time runs to over 20,000. "Sixteen years would be required to fill that gap with present programs, even if there were no personnel turnover, no increase in population and no new needs for service."

More students should be encouraged to obtain master's degrees in public health. But obviously the public health education facilities of the United States and the West are completely inadequate for providing the recommended training for the large numbers of professional public health personnel needing training in the coming decade.

There is also an educational problem for those persons presently employed in public health work who have had the requisite education program, who must be kept currently informed on new developments in public health.

An adequate supply of trained public health professionals does not depend only on public health education facilities. It also depends on the availability of an adequate pool of graduates in the disciplines on which public health draws--in medicine, dentistry, nursing, engineering, psychology, and therapy for example, and on the ability of public health agencies to successfully recruit such professionals into public health work.

RECOMMENDATIONS

- ... Public health education facilities must be expanded in the next decade.
- ... Continuation education programs are a responsibility of every employing agency in public health.

... Greater financial assistance is needed for students in public health so that more of the presently employed personnel can obtain further training.

... Greater efforts must be made in the recruitment of personnel to the public health field.

VIII.

SHARING FACILITIES ACROSS STATE LINES

There are current shortages of health science personnel in the West, shortages that are expected to become more acute in the coming decade. However, the shortage is not one of talent but rather one of training facilities. Because of this shortage of facilities, the Western states are not giving their youth full educational opportunity and they are not assuring citizens of the West enough health manpower to staff essential services.

The West has been in advance of the rest of the country in accepting the obligation of the state to provide educational opportunity; for the nation as a whole, 11 of every 20 students attend public institutions, while in the West, 16 of every 20 attend publicly-supported institutions. Western states are providing some opportunity in higher education. But this is not their whole obligation; their obligation is to provide a breadth of opportunity, so that their citizens have a fair chance to pursue any career, not just one in business, or agriculture, or mining. The West has often failed to provide this opportunity in the health sciences.

It is also of vital concern to the state that there be enough doctors, dentists, nurses, and veterinarians to serve the citizens of the state. Beyond this, the state as an employer has an interest in insuring an adequate supply of mental health and public health personnel for the public institutions and agencies of the state, for the state's mental institutions, its psychiatric clinics, and its public health agencies. The Western states are not now providing educational facilities adequate to assure the needed supply of health science personnel for the West.

While each state has the clear obligation to provide adequate educational opportunity in the health sciences, to attempt complete self-sufficiency in higher education would be folly for most states. Such facilities as medical schools, dental schools, and schools of public health all require tremendous investments, and often a state does not need an

entire facility to provide the manpower it needs. For example, Arizona needs about 10 new veterinarians each year while Colorado needs about 20; Idaho and Montana each need some 35 new dentists each year and 30 new physicians. Clearly each of these states does not need its own school in each of the health sciences, yet it needs access to a school in each discipline. Thus it makes good sense to share facilities in these specialties in order to prevent needless, expensive duplication and probably mediocre, underfinanced schools.

In 1949, the Western Governors' Conference recognized that the individual states of the West could not solve their problems of higher education alone--that a cooperative approach was needed. As a result, they took the first steps toward organizing the Western Regional Education Compact which was ratified in 1953. In the seven years of its existence, WICHE, the agency created by this Compact, has organized a number of programs for sharing facilities in the health sciences.

THE WICHE STUDENT EXCHANGE PROGRAM

The Student Exchange Program permits the states without professional schools to buy space for their students in a Western school of medicine, dentistry, or veterinary medicine. The Exchange Program has grown from modest beginnings in 1953 with 41 students, to approximately 300 students in medicine, dentistry, and veterinary medicine in the current year. Furthermore, the states that have used the Program most--Arizona, New Mexico, and Wyoming--have experienced an increase both in the number of students entering Western medical schools and in the proportion who attend Western schools. All the increase in the total number of students entering medical schools from these states is accounted for by increasing opportunity in Western schools. The number attending non-Western schools has remained practically unchanged.

However, several aspects of the present Exchange Program need adjustment:

- ... When the Program was set up, the rates of payment agreed on by sending and receiving states were: \$2,000 per medical student, \$1,600 per dental student, and \$1,200 per veterinary medicine student. In the intervening years, operating costs of professional schools have increased, so that the basis of payment is no longer a realistic one. Furthermore, this payment schedule does not provide for any capital outlay costs of the participating schools.
- ... The number of students now sponsored by some of the sending ~~states~~ does not include all the students from those states who are studying medicine, dentistry, and veterinary medicine in Western schools. This means a disproportionate sharing of the burden of cost for educating students who are not covered. First, it burdens the student who must pay out-of-state tuition

fees instead of the lower in-state fee provided for students covered by the Exchange Program. Second, it is a burden on the receiving school, since the student's tuition is considerably lower than the Student Exchange Program payment. And third, it means that some sending states are making a less adequate financial provision for this interstate, cooperative effort than others--they are covering only part of their students, and so are putting a disproportionate burden on the receiving states.

OTHER WICHE PROGRAMS FOR SHARING FACILITIES¹

A regional in-service training program for staff members of Western institutions for the mentally retarded utilizes the facilities at one of the West's leading training centers to better prepare people in top management positions in such state institutions for their work.

A regional three-year continuation education training program for nurses in leadership positions has as its nucleus three major Western nursing schools, each of which serves a sub-region of nearby states.

A regional pilot program provides additional psychiatric training for Western physicians, with top professional people from the Western states designing and executing the program.

The regional pilot summer work-study program in mental health work is a recruitment device to interest able Western college students in mental health work.

NEXT STEPS

These various devices for sharing existing facilities have been useful in taking advantage of the resources of the region, and they will continue to be useful. But they will not wholly answer the West's health science education problems. Since there are not enough facilities for health science education in the West, there are not enough facilities to share.

The crux of the problem is that expensive new facilities are needed in each of the health science disciplines. Because it is impractical for each state to attempt to provide the facilities needed in each of the health sciences, states must find new ways of sharing. This sharing must be suited to the unique circumstances of the health sciences, where facilities are

¹These are described at greater length in earlier chapters and in Opportunity in the West, the 1959 Annual Report of the Western Interstate Commission for Higher Education.

... the Western Governors' Conference requests the Western Interstate Commission for Higher Education to explore proposals for regional medical schools, and to report their findings and recommendations to the next meeting of this Conference.

* * * * *

... the Western Governors' Conference requests the Western Interstate Commission for Higher Education in cooperation with the Council of State Governments to study the development of regional facilities for juvenile delinquents who are emotionally disturbed or mentally defective; and that the findings and conclusions of the study be submitted to the next annual meeting of the Conference.

Resolutions of the Western
Governors' Conference,
September 24-28, 1959
Sun Valley, Idaho.

extremely costly, where a concentration of facilities for different disciplines in one center is often considered desirable, and where operating cost is many times that of the average collegiate program. These factors limit the kinds of sharing that are possible and can operate successfully in other fields of study.

In education, as in other ventures, it is easier to follow traditional and proven paths. But these traditional ways of working are no longer adequate to meet the crisis the West faces in health science education. The problems are unprecedented, and they will require unprecedented answers. Clearly, it is time to strike out on bold new ventures.

The Western Governors' Conference opened the way to serious consideration of such new ventures. Last fall, the Governors recognized the serious nature of the problem of health science education and the need to seek new ways of coping with it. In two resolutions, they instructed WICHE to investigate the feasibility of regional facilities--of facilities sponsored by several states, with costs shared by those states. Specifically, the Governors asked investigation of the possibility of regional medical schools and regional facilities for emotionally disturbed or mentally deficient juvenile delinquents.

Such proposals as regional schools are new, and it is easy to call them impractical or politically impossible and to discard them without giving them serious consideration. But, though there are few precedents for such multi-state facilities, the idea makes good sense; it is obviously cheaper and far wiser to build a large-scale facility that meets the needs of several states than to build a smaller and less adequate one for each state.

Such a project involves answering many questions and exploring many approaches. It may involve development of new administrative techniques and legal approaches. For example, states might share the capital outlay expense, the current operating expense, and the management of a multi-state facility; or one state could take the initiative in construction and management, with other states committed to contributing to all costs--both construction and operating costs--on a prorated basis, possibly through a modification of the present Student Exchange Program system.

Serious decisions would have to be made:

- Where will the facility be located?
- Who will manage it?
- What part of the cost will each state have to bear?
- What share will each state have in use of the facility?
- For how long a period must the states commit themselves in terms of appropriations for capital outlay and for operation?

Such questions will be difficult to answer. Nonetheless, it will be easier for each state to find these answers than it will be for them to find

unilateral solutions. Given problems of the present magnitude, it will be necessary to undertake multi-state solutions, and to bring to these solutions the effort and understanding needed to make them successful.

APPENDICES

APPENDIX A

Methodology

The estimates used in this study are based primarily on the six previous WICHE health manpower studies, with estimates for dentistry, dental hygiene, veterinary medicine, and mental health brought up to date. The time projection in this study is for the period 1958 to 1970; where data from other WICHE studies are used, they are adapted to this time period. Unfortunately, in many instances the national agencies on whose data the regional estimates are based did not include Alaska and Hawaii in their studies. For this reason estimates and charts in the main body of the report do not include Alaska and Hawaii, except in listing the professional schools. However, the state-by-state presentation in Appendix A includes those data available on Alaska and Hawaii, though in some instances these are derived from different sources than are the estimates for other states.

State-by-state data on health science manpower needs and resources are presented in Appendix A. These represent a breakdown of the regional figures included in the main body of the report. The state-by-state data provide only a starting point for each state's analysis of its health manpower situation and needs. They do not take into account any local factors beyond population increase, reasonable ratios of professional personnel to population, and existing educational facilities.

In using the data for a given state, it should be kept in mind that other pertinent factors will affect that state's situation. Each state is unique in such important factors affecting demand for health services as: economic resources, rural-urban distribution, and educational and cultural background of its citizens. Also, in- and out-migration of professional personnel and students will greatly influence supply.

Finally, in considering the average annual increment needed in each of the health sciences it is important to remember that the figures on new personnel needed represent an annual average over the decade. As each year goes by without providing this average increment, a further deficit will be accumulated, thereby raising the numbers of new personnel needed for the remaining years. Even in states that plan to expand existing schools or build new schools shortly, there will be a lag between the time the decision is made and the time when the first class is graduated, thereby increasing the backlog or "demand" and raising the annual increment needed for the following years.

This study draws heavily for data and recommendations on the individual WICHE studies on medicine, dentistry, nursing, veterinary medicine, and mental health that are listed on the inside of the front cover. These earlier studies were prepared with the assistance of advisory committees consisting of experts in the respective areas. The names of the advisory committee members are listed in Appendix B.

APPENDIX 2

ALASKA

Population:	1940	73,000
	1950	137,000
	1958	191,000
	*1970	290,000

	<u>Physi- cians</u>	<u>Nurses</u>	<u>Dentists</u>	<u>Veterin- arians</u>
Present manpower supply	101	429	49	8
Ratio of health service personnel per 100,000 population	49	260	22	4
Total needed for 1970	135	870	230	10
Total new personnel needed (replacements and additional) to reach the 1970 total	80	700	200	5
New personnel needed annually to reach the 1970 total	5	60	15	**
Current annual graduations from schools in the state	0	0	0	0

STUDENT EXCHANGE PROGRAM

<u>Year</u>	<u>Medicine</u>		<u>Dentistry</u>		<u>Vet. medicine</u>		<u>Total</u>	
	<u>No. of students</u>	<u>Amount</u>	<u>No. of students</u>	<u>Amount</u>	<u>No. of students</u>	<u>Amount</u>	<u>No. of students</u>	<u>Amount</u>
1956-57	4	\$ 8,000		\$	1	\$ 1,200	5	\$ 9,200
1957-58	3	6,000	1	1,600	1	1,200	5	8,800
1958-59	6	12,000	2	3,200	1	1,200	9	16,400
1959-60	7	14,000	2	3,200	1	1,200	10	18,400
	<u>20</u>	<u>\$40,000</u>	<u>5</u>	<u>\$ 8,000</u>	<u>4</u>	<u>\$ 4,800</u>	<u>29</u>	<u>\$52,800</u>

* Projected
** Less than 5

ARIZONA

Population:	1940	499,000
	1950	750,000
	1958	1,175,000
	*1970	1,669,000

	<u>Physi- cians</u>	<u>Nurses</u>	<u>Dentists</u>	<u>Veterin- arians</u>
Present manpower supply	1,075	3,080	316	121
Ratio of health service personnel per 100,000 population	95	271	28	11
Total needed for 1970	2,050	5,405	1,440	190
Total new personnel needed (replacements and additional) to reach the 1970 total	1,235	4,175	1,250	120
New personnel needed annually to reach the 1970 total	105	350	105	10
Current annual graduations from schools in the state	0	110	0	0

STUDENT EXCHANGE PROGRAM

	<u>Medicine</u>		<u>Dentistry</u>		<u>Vet. medicine</u>		<u>Total</u>	
<u>Year</u>	<u>No. of students</u>	<u>Amount</u>	<u>No. of students</u>	<u>Amount</u>	<u>No. of students</u>	<u>Amount</u>	<u>No. of students</u>	<u>Amount</u>
1953-54	2	\$ 4,000	2	\$ 3,200	5	\$ 6,000	9	\$ 13,200
1954-55	10	19,333	3	4,800	11	13,200	24	37,333
1955-56	12	24,000	4	6,400	19	22,800	35	53,200
1956-57	21	41,333	7	11,200	24	28,800	52	81,333
1957-58	26	51,333	4	6,400	26	31,200	56	88,933
1958-59	32	64,000	12	19,200	26	31,200	70	114,400
1959-60	40	80,000	21	33,600	20	24,000	81	137,600
	<u>143</u>	<u>\$ 283,999</u>	<u>53</u>	<u>\$84,800</u>	<u>131</u>	<u>\$157,200</u>	<u>327</u>	<u>\$525,999</u>

* Projected

CALIFORNIA

Population:	1940	6,907,000
	1950	10,586,000
	1958	14,284,000
	*1970	19,997,000

	<u>Physi- cians</u>	<u>Nurses</u>	<u>Dentists</u>	<u>Veterin- arians</u>
Present manpower supply	21,803	37,385	7,401	1,574
Ratio of health service personnel per 100,000 population	157	269	52	11
Total needed for 1970	33,215	60,890	16,240	2,230
Total new personnel needed (replacements and additional) to reach the 1970 total	18,310	45,935	11,800	1,285
New personnel needed annually to reach the 1970 total	1,525	3,830	985	105
Current annual graduations from schools in the state	340	1,155	258	48

* Projected

COLORADO

Population:	1940	1,123,000			
	1950	1,325,000			
	1958	1,655,000			
	*1970	2,064,000			
		<u>Physi-</u> <u>cians</u>	<u>Nurses</u>	<u>Dentists</u>	<u>Veterin-</u> <u>arians</u>
Present manpower supply		2,390	5,647	764	345
Ratio of health service personnel per 100,000 population		143	338	47	20
Total needed for 1970		3,020	7,425	1,760	445
Total new personnel needed (replacements and additional) to reach the 1970 total		1,470	5,165	1,300	235
New personnel needed annually to reach the 1970 total		120	430	110	20
Current annual graduations from schools in the state		79	249	0	62

STUDENT EXCHANGE PROGRAM

Dentistry		
<u>Year</u>	<u>No. of students</u>	<u>Amount</u>
1956-57	2	\$ 3,200
1957-58	2	3,200
1958-59	7	11,200
1959-60	11	17,600
	<u>22</u>	<u>\$35,200</u>

* Projected

HAWAII

Population: 1940 423,000
 1950 500,000
 1958 632,000
 *1970 748,000

	<u>Physi- cians</u>	<u>Nurses</u>	<u>Dentists</u>	<u>Veterin- arians</u>
Present manpower supply	574	1,681	387	29
Ratio of health service personnel per 100,000 population	98	305	62	5
Total needed for 1970	695	2,245	600	35
Total new personnel needed (replacements and additional) to reach the 1970 total	325	1,945	370	20
New personnel needed annually to reach the 1970 total	25	160	30	**
Current annual graduations from schools in the state	0	97	0	0

Hawaii is participating in the student exchange program for the first time during the 1959-60 year. The legislative appropriation of \$20,000 for the student exchange program would cover the equivalent of 5 medical students, 4 dental students, and 3 veterinary medicine students. To date, no students have been certified.

* Projected
 ** Less than 5

IDAHO

Population:	1940	525,000
	1950	589,000
	1958	652,000
	*1970	727,000

	<u>Physi- cians</u>	<u>Nurses</u>	<u>Dentists</u>	<u>Veterin- arians</u>
Present manpower supply	564	1,418	268	121
Ratio of health service personnel per 100,000 population	88	222	40	18
Total needed for 1970	700	2,100	560	128
Total new personnel needed (replacements and additional) to reach the 1970 total	335	1,530	400	55
New personnel needed annually to reach the 1970 total	30	125	35	5
Current annual graduations from schools in the state	0	61	0	0

STUDENT EXCHANGE PROGRAM

Year	<u>Medicine</u>		<u>Dentistry</u>		<u>Vet. medicine</u>		<u>Total</u>	
	<u>No. of students</u>	<u>Amount</u>	<u>No. of students</u>	<u>Amount</u>	<u>No. of students</u>	<u>Amount</u>	<u>No. of students</u>	<u>Amount</u>
1955-56		\$	1	\$ 1,600	2	\$ 2,400	3	\$4,000
1956-57			3	4,800	4	4,800	7	9,600
1957-58			3	4,800	4	4,800	7	9,600
1958-59			2	3,200	4	4,800	6	8,000
1959-60	13	26,000	8	12,800	5	6,000	26	44,800
	<u>13</u>	<u>\$26,000</u>	<u>17</u>	<u>\$27,200</u>	<u>19</u>	<u>\$22,800</u>	<u>49</u>	<u>\$76,000</u>

* Projected

MONTANA

Population:	1940	559,000
	1950	591,000
	1958	675,000
	*1970	730,000

	<u>Physi- cians</u>	<u>Nurses</u>	<u>Dentists</u>	<u>Veterin- arians</u>
Present manpower supply	629	2,213	306	128
Ratio of health service personnel per 100,000 population	95	332	44	19
Total needed for 1970	745	2,505	600	140
Total new personnel needed (replacements and additional) to reach the 1970 total	345	1,620	420	65
New personnel needed annually to reach the 1970 total	30	135	35	5
Current annual graduations from schools in the state	0	172	0	0

STUDENT EXCHANGE PROGRAM

	<u>Medicine</u>		<u>Dentistry</u>		<u>Vet. medicine</u>		<u>Total</u>	
<u>Year</u>	<u>No. of Students</u>	<u>Amount</u>	<u>No. of students</u>	<u>Amount</u>	<u>No. of students</u>	<u>Amount</u>	<u>No. of students</u>	<u>Amount</u>
1953-54	1	\$ 2,000		\$	3	\$ 3,600	4	\$ 5,600
1954-55	2	4,000	1	1,600	4	4,800	7	10,400
1955-56	3	6,000	3	4,800	6	7,200	12	18,000
1956-57	4	8,000	5	8,000	9	10,800	18	26,800
1957-58	4	8,000	6	9,600	8	9,600	18	27,200
1958-59	4	8,000	6	9,600	8	9,600	18	27,200
1959-60	5	10,000	6	9,600	9	10,800	20	30,400
	<u>23</u>	<u>\$46,000</u>	<u>27</u>	<u>\$43,200</u>	<u>47</u>	<u>\$56,400</u>	<u>97</u>	<u>\$145,600</u>

* Projected

NEVADA:

Population:	1940	110,000			
	1950	160,000			
	1958	272,000			
	*1970	395,000			
		<u>Physi-</u>		<u>Dentists</u>	<u>Veterin-</u>
		<u>cians</u>	<u>Nurses</u>		<u>arians</u>
Present manpower supply		255	793	101	50
Ratio of health service personnel per 100,000 population		96	297	38	19
Total needed for 1970		510	1,360	360	85
Total new personnel needed (replacements and additional) to reach the 1970 total		320	1,040	300	55
New personnel needed annually to reach the 1970 total		25	85	25	5
Current annual graduations from schools in the state		0	None Reported	0	0

STUDENT EXCHANGE PROGRAM

Nevada is participating in the student exchange program for the first time during the 1959-60 year. There is no budgetary specification for the distribution of these funds by type of program. However, the legislative appropriation of \$15,000 for the student exchange program would cover the equivalent of three medical students three dental students, and three students of veterinary medicine. To date, no students have been certified.

NEW MEXICO

Population:	1940	532,000
	1950	681,000
	1958	855,000
	*1970	1,112,000

	<u>Physi- cians</u>	<u>Nurses</u>	<u>Dentists</u>	<u>Veterin- arians</u>
Present manpower supply	647	1,727	213	80
Ratio of health service personnel per 100,000 population	78	208	25	10
Total needed for 1970	985	3,380	900	105
Total new personnel needed (replacements and additional) to reach the 1970 total	540	2,683	770	60
New personnel needed annually to reach the 1970 total	45	225	65	5
Current annual graduations from schools in the state	0	19	0	0

STUDENT EXCHANGE PROGRAM

	Medicine		Dentistry		Vet. medicine		Total	
<u>Year</u>	<u>No. of students</u>	<u>Amount</u>	<u>No. of students</u>	<u>Amount</u>	<u>No. of students</u>	<u>Amount</u>	<u>No. of students</u>	<u>Amount</u>
1953-54	17	\$ 34,000			3	\$ 3,600	20	\$ 37,600
1954-55	21	42,000			6	7,200	27	49,200
1955-56	21	42,000			10	12,000	31	54,000
1956-57	30	60,000			12	14,400	42	74,400
1957-58	32	64,000			11	13,200	43	77,200
1958-59	36	72,000			12	14,400	48	86,400
1959-60	37	74,000	1	\$ 1,600	11	13,200	49	88,800
	<u>194</u>	<u>\$388,000</u>	<u>1</u>	<u>\$1,600</u>	<u>65</u>	<u>\$78,000</u>	<u>260</u>	<u>\$467,600</u>

*Projected

OREGON

population:	1940	1,090,000
	1950	1,521,000
	1958	1,746,000
	*1970	2,433,000

	<u>Physi- cians</u>	<u>Nurses</u>	<u>Dentists</u>	<u>Veterin- arians</u>
Present manpower supply	2,142	5,154	1,096	246
Ratio of health service personnel per 100,000 population	121	291	62	14
Total needed for 1970	2,700	6,950	1,850	320
Total new personnel needed (replacements and additional) to reach the 1970 total	1,325	4,890	1,200	175
New personnel needed annually to reach the 1970 total	110	405	100	15
Current annual graduations from schools in the state	70	133	75	0

STUDENT EXCHANGE PROGRAM

Veterinary Medicine

<u>Year</u>	<u>No. of students</u>	<u>Amount</u>
1953-54	3	\$ 3,600
1954-55	10	12,000
1955-56	14	16,800
1956-57	19	22,800
1957-58	23	27,600
1958-59	22	26,400
1959-60	25	30,000
	<u>116</u>	<u>\$139,200</u>

* Projected

UTAH

Population:	1940	550,000
	1950	689,000
	1958	858,000
	*1970	1,114,000

	<u>Physi- cians</u>	<u>Nurses</u>	<u>Dentists</u>	<u>Veterin- arians</u>
Present manpower supply	1,026	1,712	437	108
Ratio of health service personnel per 100,000 population	120	201	50	12
Total needed for 1970	1,435	3,455	920	145
Total new personnel needed (replacements and additional) to reach the 1970 total	740	2,770	660	80
New personnel needed annually to reach the 1970 total	60	230	55	5
Current annual graduations from schools in the state	48	129	0	0

STUDENT EXCHANGE PROGRAM

Veterinary Medicine

<u>Year</u>	<u>No. of students</u>	<u>Amount</u>
1954-55	4	\$ 4,800
1955-56	8	9,600
1956-57	14	16,800
1957-58	19	22,800
1958-59	18	21,600
1959-60	18	21,600
	<u>81</u>	<u>\$97,200</u>

* Projected

WASHINGTON:

Population:	1940	1,736,000			
	1950	2,379,000			
	1958	2,770,000			
	*1970	3,594,000			
		<u>Physi-</u>			<u>Veterin-</u>
		<u>cians</u>	<u>Nurses</u>	<u>Dentists</u>	<u>arians</u>
Present manpower supply		3,269	8,091	1,586	440
Ratio of health service personnel per 100,000 population		120	297	57	16
Total needed for 1970		4,115	10,375	2,760	550
Total new personnel needed (replacements and additional) to reach the 1970 total		2,005	7,140	1,810	185
New personnel needed annually to reach the 1970 total		165	595	150	25
Current annual graduations from schools in the state		72	366	60	48

* Projected

WYOMING

Population:	1940	251,000
	1950	291,000
	1958	315,000
	*1970	382,000

	<u>Physi- cians</u>	<u>Nurses</u>	<u>Dentists</u>	<u>Veterina- rians</u>
Present manpower supply	256	949	138	65
Ratio of health service personnel per 100,000 population	81	300	43	20
Total needed for 1970	325	1,135	300	75
Total new personnel needed (replacements and additional) to reach the 1970 total	155	755	220	40
New personnel needed annually to reach the 1970 total	10	65	20	5
Current annual graduations from schools in the state	0	9	0	0

STUDENT EXCHANGE PROGRAM

	<u>Medicine</u>		<u>Dentistry</u>		<u>Vet. medicine</u>		<u>Total</u>	
<u>Year</u>	<u>No. of students</u>	<u>Amount</u>	<u>No. of students</u>	<u>Amount</u>	<u>No. of students</u>	<u>Amount</u>	<u>No. of students</u>	<u>Amount</u>
1953-54	5	\$ 10,000		\$		\$	5	\$ 10,000
1954-55	21	42,000	2	3,200	5	6,000	28	51,200
1955-56	23	46,000	3	4,800	9	10,800	35	61,600
1956-57	23	46,000	5	8,000	14	16,800	42	70,800
1957-58	20	40,000	7	11,200	18	21,600	45	72,800
1958-59	16	32,000	9	14,400	18	21,600	43	68,000
1959-60	12	24,000	9	14,400	19	22,800	40	61,200
	<u>120</u>	<u>\$240,000</u>	<u>35</u>	<u>\$56,000</u>	<u>83</u>	<u>\$99,600</u>	<u>238</u>	<u>\$395,600</u>

* Projected

APPENDIX 3

Western Professional Schools in the Health Sciences* Fall 1959

ALASKA

None

ARIZONA

Nursing

Arizona State University
University of Arizona

CALIFORNIA

Medicine

University of California, San Francisco
University of California, Los Angeles
Stanford University
College of Medical Evangelists
University of Southern California

Dentistry

College of Physicians and Surgeons
University of California, San Francisco
University of Southern California
College of Medical Evangelists

Dental Hygiene

University of California, San Francisco
University of Southern California

Nursing

Humboldt State College
Chico State College
Fresno State College

CALIFORNIA (continued)

Nursing (continued)

College of Medical Evangelists
Long Beach State College
Los Angeles State College
Mount St. Mary's College
University of California, Los Angeles
Sacramento State College
San Diego State College
San Francisco State College
Stanford University
University of San Francisco
University of California, San Francisco
San Jose State College

Veterinary Medicine

University of California, Davis

Public Health

University of California, Berkeley
University of California, Los Angeles (not yet accredited)

Psychiatric Nursing

University of California, Berkeley
University of California, Los Angeles

Social Work

University of Southern California
University of California, Los Angeles
University of California, Berkeley

Psychiatric residencies

Camarillo State Hospital
Veterans Administration Hospital, Long Beach

*For nursing, includes only collegiate programs. A complete listing, including junior colleges and hospital schools and type of collegiate programs offered, is included in Nurses for the West. Psychiatric residencies are 3-year programs unless otherwise indicated.

CALIFORNIA (continued)

Psychiatric residencies(continued)

Los Angeles County Hospital
 Mount Sinai Hospital
 University of California Hospital,
 Los Angeles
 Veterans Administration Hospital,
 Los Angeles
 Metropolitan State Hospital
 Stanford Medical Center and
 Assoc. Hospitals:
 Palo Alto-Stanford Hospital
 Center
 Veterans Administration
 Hospital, Palo Alto
 Langley Porter Clinic
 Veterans Administration Hospital,
 Sepulveda
 Mendocino State Hospital
 Agnews State Hospital**
 Herrick Memorial Hospital**
 Mount Zion Hospital**
 Stockton State Hospital**
 Compton Sanitarium***
 Sonoma State Hospital***
 Patton State Hospital***
 Pacific State Hospital***
 Kaiser Foundation Hospital***
 St. Francis Memorial Hospital***
 St. Mary's Hospital***

Clinical psychology
 University of Southern California
 University of California,
 Berkeley
 University of California, Los
 Angeles
 Stanford University

COLORADO

Medicine
 University of Colorado

Nursing
 University of Colorado
 University of Denver
 Loretto Heights College

COLORADO (continued)

Veterinary medicine
 Colorado State University

Psychiatric Residencies
 University of Colorado Medical
 Center:
 Colorado Psychiatric Hospital
 Veterans Administration Hospital,
 Denver
 Colorado State Hospital***

Social Work
 University of Denver

Psychiatric Nursing
 University of Colorado

Clinical psychology
 University of Colorado

HAWAII

Nursing
 University of Hawaii

Psychiatric residencies
 Queen's Hospital
 Territorial Hospital

Social Work
 University of Hawaii

IDAHO

Nursing
 Idaho State College

MONTANA

Nursing
 Montana State College
 College of Great Falls
 Carroll College

NEVADA

Nursing
 University of Nevada

** Two-year programs

***One-year programs

NEW MEXICO

Nursing
University of New Mexico

OREGON

Medicine
University of Oregon

Dentistry
University of Oregon

Dental Hygiene
University of Oregon

Nursing
University of Oregon
University of Portland

Psychiatric residencies
University of Oregon Medical
School
Hospitals and Clinics
Oregon State Hospital

Clinical psychology
University of Oregon

UTAH

Medicine
University of Utah

Nursing
Brigham Young University
University of Utah

Psychiatric residencies
Salt Lake County General
Hospital
Veterans Administration Hospital,
Salt Lake City

Social Work
University of Utah

UTAH (continued)

Clinical psychology
University of Utah

Psychiatric nursing
University of Utah (in process of
being accredited)

WASHINGTON

Medicine
University of Washington

Nursing
Walla Walla College
Pacific Lutheran College
Seattle University
University of Washington
Whitworth College

Dentistry
University of Washington

Dental Hygiene
University of Washington

Veterinary Medicine
Washington State University

Psychiatric residencies
University of Washington Affiliated
Hospitals:
King County Hospital Unit No. 1
University Hospital
Veterans Administration Hospital,
Seattle

Social work
University of Washington

Psychiatric nursing
University of Washington

Clinical psychology
University of Washington
Washington State University

WYOMING

Nursing
University of Wyoming

APPENDIX 4

WICHE MEDICAL EDUCATION ADVISORY COMMITTEE

Richard J. Stull, Vice President, Medical Affairs,
University of California, Berkeley. . .Chairman

George Aagaard, M.D., Dean, University of Washington
School of Medicine, Seattle

Robert H. Alway, M.D., Dean, Stanford University
School of Medicine, Palo Alto

Fred Anderson, M.D., Reno

Milton W. Durham, M.D., Spokane

Robert Glaser, M.D., Dean, University of Colorado
School of Medicine, Denver

Richard A. Harvill, President, University of Arizona
Tucson

Robert Leonard King, M.D., Mason Clinic, Seattle

Clayton G. Loosli, M.D., Dean, University of Southern
California School of Medicine, Los Angeles

William R. Lovelace, II, M.D., Albuquerque

Robert U. Massey, M.D., Head, Department of Internal
Medicine, Lovelace Foundation, Albuquerque

Frank L. McPhail, M.D., Great Falls

Dermont W. Melick, M.D., Phoenix

William E. Nerlich, Asst. Dean, Student Affairs,
University of Southern California School of
Medicine, Los Angeles

Tom L. Popejoy, President, University of New Mexico,
Albuquerque

Alfred M. Popma, M.D., Boise

Phillip M. Price, M.D., Dean, University of Utah
School of Medicine, Salt Lake City

John R. Richards, M.D., Chancellor, Oregon System for
Higher Education

Thomas Richert, M.D., Fronk Clinic, Honolulu, Hawaii

John B. deC. M. Saunders, M.D., Dean, University of
California School of Medicine, San Francisco

Calvin F. Schmid, Office of Population Research,
University of Washington, Seattle

Robert B. Wilkins, M.D., Anchorage

Franklin D. Yoder, M.D., Director, Wyoming Department
of Public Health, Cheyenne

WICHE DENTAL ADVISORY COMMITTEE

- Dr. Harold L. Enarson, Executive Director, WICHE,
Boulder, Colorado Chairman.
- Dr. C. Earl Albrecht, Commissioner of Health, Alaska
Department of Health, Juneau
- Dr. Berton E. Anderson, Dean, School of Dentistry,
University of Washington, Seattle
- Dr. Harold E. Cafferata, Nevada State Board of Dental
Examiners, Reno
- Dr. John H. Dawe, Office of the Secretary, Hawaii
Dental Society, Honolulu
- Dr. Willard C. Fleming, Dean, College of Dentistry,
University of California, San Francisco
- Dr. Charles R. Hayman, Acting State Commissioner of
Health of Alaska, Juneau
- Dr. W. A. Hocker, Casper
- Dr. William J. Johnson, Phoenix
- Dr. Ambrose R. McCabe, St. Maries, Idaho
- Dr. Robert W. McNulty, Dean, School of Dentistry,
University of California, Los Angeles
- Dr. John Miller, Spenard, Alaska
- Dr. W. Stuart Neblett, President, State Board of Dental
Examiners of California, San Francisco
- Dr. Harold T. Noyes, Dental School, University of Oregon
Portland
- Dr. Robert L. Nugent, Vice President, University of
Arizona, Tucson
- Dr. Rulon W. Openshaw, Hollywood
- Dr. R. E. Pate, Denver
- Dr. Robert E. Paulsen, Executive Secretary, Washington
Dental Association, Seattle
- Dr. John K. Phelan, Albuquerque
- Dr. Charles K. Phillips, Denver
- Dr. F. J. Quinn, Butte
- Dr. John Dale Russell, Chancellor, New Mexico Board of
Educational Finance, Santa Fe
- Dr. Calvin F. Schmid, Executive Secretary, Washington
Census Board, Seattle
- Miss Patricia Stearns, Idaho Department of Health, Boise
- Dr. Charles Swanson, Columbus, Montana
- Dr. O. T. Wherry, Portland
- Dr. Ernest L. Wilkinson, President, Brigham Young University,
Provo
- Dr. Franklin Yoder, Director, Wyoming Department of Public
Health Cheyenne

EXECUTIVE COMMITTEE OF THE WICHE NURSING COUNCIL

Mrs. Mildred Quinn, Dean, College of Nursing,
University of Utah, Salt Lake City. . . Chairman

Mrs. Pearl Parvin Coulter, Director, School of Nursing,
University of Arizona, Tucson

Mrs. Lulu Wolf Hassenplug, Dean, School of Nursing,
University of California Medical Center, Los Angeles

Dr. Katherine Hoffman, Asst. Dean, School of Nursing,
University of Washington, Seattle

Miss Eleanor King, Dean, College of Nursing, University
of New Mexico, Albuquerque

Miss Margaret Metzger, Director, Division of Nursing,
Loretto Heights College, Loretto, Colorado

Dr. Helen Nahm, Dean, School of Nursing, University of
California Medical Center, San Francisco

WICHE ADVISORY COMMITTEE ON VETERINARY MEDICAL EDUCATION

William E. Morgan, President, Colorado State University,
Fort Collins Chairman

D. E. Jasper, Dean of Veterinary Medicine, University
of California, Davis

Rue Jensen, Dean of Veterinary Medicine, Colorado State
University, Fort Collins

E. C. Stone, Dean of Veterinary Medicine, Washington
State University, Pullman

MENTAL HEALTH

Representatives from the Governor's Mental Health Survey
Committee of each state. The Mental Health Project
Director was Dr. C. H. Harden Branch, Head of Psychiatry,
University of Utah.

WICHE PUBLICATIONS, 1959

Admissions Practices in Western Colleges and Universities

Annual Report, 1958

Coordinated Training in Rehabilitation

Higher Education in the West, Newsletter

Institutional Research in the West

Mental Health Research Advisory Service, Brochure

Mental Health Training and Research Highlights, Newsletter

Nurses for the West

*Proceedings of the Second Annual Conference, Western Council
on Higher Education for Nursing*

*Quality and Opportunity in Higher Education, Proceedings of the
Legislative Workshop*

The Junior College Nursing Program

The West's Medical Manpower Needs

*Vital Issues in Western Higher Education, No. 1, "A Balance Sheet
in Higher Education"*

Who Should Go to College?

Yardsticks and Formulas in University Budgeting

